HINTS FOR CARPENTERS

A COLLECTION OF USEFUL PRACTICAL HINTS, IDEAS, WRINKLES AND SUGGESTIONS, GIVING DIRECTIONS FOR MAKING VARIOUS TOOLS AND APPLIANCES THAT WILL LESSEN THE WORK OF THE CARPENTER AND JOINER

Charles G. Baker

COMPILED AND EDITED

BY

ALBERT FAIR pseud.

Author of "Steel Square as a Calculating Machine," "Practical House Framing," "Short Cuts in Carpentry," etc.

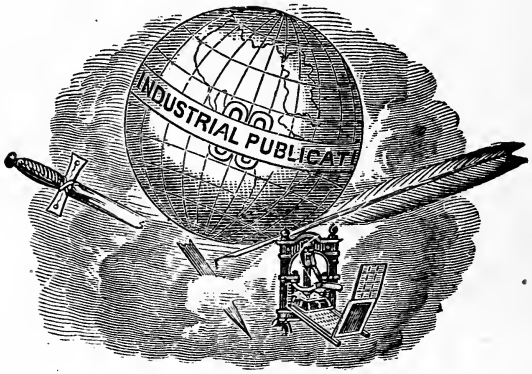
ILLUSTRATED BY 100 ENGRAVINGS

NEW YORK

INDUSTRIAL BOOK COMPANY

1909

HINTS FOR CARPENTERS



PREFACE

THE object of this book is to bring together in a convenient form, for easy reference, some of the best practical hints and schemes of various practical men.

Not a mere one-man or one-idea book,-but a book really made by various practical men and one that will be very useful to the old experienced carpenter, as well as to the young beginner.

All of the matter in this book was published in *The Practical Carpenter,* and it was at the suggestion of the editor, Mr. Charles G. Peker, that the task of selecting, arranging and editing the suitable matter was undertaken by me.

The task, however, was a very pleasant one, with the knowledge that the information here given will make the work of the carpenter easier and better.

ALBERT FAIR.

NEW YORK, January 6, 1909.

HINTS FOR CARPENTERS

EVERY carpenter worthy of the name takes pride in his work and has good tools to work with. Not tools that were good, but that *are* good by being well cared for. The metal parts are not rusty, the cutting edges are keen and not broken here and there. The handles are tight —everything is in working order.

In the following pages a number of practical hints and recipes are given for the care, repair, sharpening, removing rust, and the selection of tools.

A safe rule to follow in making purchases is to buy tools made by a well-known firm, but there are constantly new tools being put on the market by new firms that are of some special value, and therefore all carpenters should know how to select a serviceable tool. Remember that a good, honestly made tool has got to be sold at a good price—the most expensive tools are the "cheap" ones.

Carpenters pay particular attention when they buy saws, squares and planes, but outside of these they do not seem to be as particular.

It is not generally known that the light of the sun and the moon exercise a destructive effect on edge tools. Knives, drills, scythes and sickles assume a blue color if they are exposed for some length of time to the light and heat of the sun; the sharp edge disappears, and the tool is rendered absolutely useless until it is retempered. Purchasers should therefore be on their guard against buying tools from retail dealers and peddlers, which for show purposes have probably been exposed for days together to the glare of the sun. The unserviceableness of tools acquired under these conditions is generally wrongly attributed to bad material or to inferior workmanship. A similar prejudicial effect has been exercised by moonlight. An ordinary crosscut saw is asserted to have been put out of shape in a single night by exposure to the moon.

No man should use a dull tool. If there is time to use it, there ought to be time to keep it in good order.

There is nothing like having an exact place for every tool and keeping it there when not in use.

Keeping tools in good order is as necessary as keeping them in proper place.

THE CARE OF TOOLS

The wooden parts of tools, such as the stocks of planes and handles of chisels, are often made to have a nice appearance by French polishing, but this adds nothing to their durability. A much better plan is to let them soak

in linseed oil for a week, and rub them with a cloth for a few minutes every day for a week or two. This produces a beautiful surface and at the same time exerts a solidifying and preserving action on the wood. The following recipes are recommended for preventing rust on iron and steel surfaces:

1. Caoutchouc oil is said to have proved efficient in preventing rust and to have been adopted by the German army. It only requires to be spread with a piece of flannel in a very thin layer over the metallic surface, and allowed to dry up. Such a coating will afford security against all atmospheric influences and will not show any cracks under the microscope after a year's standing. To remove it the article has simply to be treated with caoutchouc oil again and washed again after twelve to twenty-four hours.

2. A solution of india-rubber in benzine has been used for years as a coating for steel, iron and lead, and has been found a simple means of keeping them from oxidizing. It can be easily applied with a brush, and is easily rubbed off. It should be made about the consistency of cream.

3. All steel articles can be perfectly preserved from rust by putting a lump of freshly burnt lime in the drawer or case in which they are kept. If the things are to be moved—as a gun in its case, for instance—put the lime in a muslin bag. This is especially valuable for specimens of iron when fractured, for in a moderately dry place the

lime will not want renewing for many years, as it is capable of absorbing a large amount of moisture. Articles in use should be placed in a box nearly filled with thoroughly slaked lime. Before using them rub well with a woolen cloth.

4. The following mixture forms an excellent brown coating for preventing iron and steel from rust: Dissolve two parts crystallized iron chloride, two antimony chloride, and one tannin in four of water, and apply with sponge or rag, and let dry. Then another coat of paint is applied, and again another if necessary, until the color becomes dark as desired. When dry it is washed with water, allowed to dry again, and the surface polished with boiled linseed oil. The antimony chloride must be as near neutral as possible.

5. To keep tools from rusting: Take ½ oz. of camphor, dissolve in 1 lb. melted lard; take off the scum, and mix in as much fine black lead (graphite) as will give it an iron color. Clean the tools and smear with this mixture. After twenty-four hours rub clean with a soft linen cloth. The tools will keep clean for months under ordinary circumstances.

6. Put one quart freshly slaked lime, ½ lb. washing soda, ½ lb. soft soap in a bucket, and sufficient water to cover the articles; put in the tools as soon as possible after use, and wipe them up next morning, or let them remain until wanted.

7. Soft soap, with half its weight in pearl ash, 1 oz. of mixture in about one gallon boiling water, is in every-day use in most engineers' shops in the drip-cans used for turning long articles wrought in wrought iron and steel. The work, though constantly moist, does not rust, and bright nuts are immersed in it for days till wanted, and retain their polish.

8. Mix slowly together 6 oz. or 8 oz. lard to 1 oz. resin, stirring till cool; when it is semi-fluid, it is ready for use. If too quick, it may be further let down by coal oil or benzine. Rubbed on bright surfaces ever so thinly, it preserves the polish effectually, and may be readily rubbed off.

9. To prevent metal from oxidation: polished iron or steel for instance, the requisite is to exclude air and moisture from the actual metallic surface; therefore, polished tools are usually kept in wrappings of oil-cloth and brown paper, and thus protected they will preserve a spotless face for an unlimited time. When these metals come to be of necessity exposed in being converted to use, it is necessary to protect them by means of some permanent dressing, and boiled linseed oil, which proves a lasting covering, as it dries on, is one of the best preservatives, if not the best. But in order to give it body it should be thickened by the addition of some pigment, and the very best, because the most congenial of pigments, is the ground oxide of the same metal, or, in plain words, rusted iron,

reduced to an impalpable powder, for the dressing of iron and steel, which thus forms the pigment or oxide paint.

10. Slake a piece of quicklime with just enough water to cause it to crumble in a covered pot, and while hot add tallow to it and work into paste, and use this to cover over bright work. It can be easily wiped off.

11. Olmsted's varnish is made by melting 2 oz. resin in 1 lb. fresh sweet lard, melting the resin first, and then adding the lard, and mixing thoroughly. This is applied to the metal, which should be warm, if possible, and perfectly cleaned; it is afterwards rubbed off. This has been well proved and tested for many years, and is particularly well suited for planished and Russian iron surfaces, which a slight rust is apt to injure very seriously.

12. Take 2 oz. of tallow and 1 oz. of resin; melt together and strain, while hot, to remove the specks which are in the resin. Apply a slight coat on the tools with a brush, and it will keep off the rust for any length of time.

RUST REMOVERS

1. Cover the metal with sweet oil, well rubbed in, and allow to stand for forty-eight hours; smear with oil applied freely with a feather or piece of cotton-wool after rubbing the steel. Then rub with unslaked lime reduced to as fine a powder as possible.

2. Immerse the article to be cleaned for a few minutes, until all the dirt and rust is taken off, in a strong solu-

tion of potassium cyanide, say about ½ oz. in a wineglassful of water, take it out and clean it with a toothbrush with some paste composed of potassium cyanide, castile soap, whiting and water mixed into a paste of about a consistency of thick cream.

MARKING TOOLS

From the wails that most carpenters make about how they lose their tools, it almost seems that the commandment "Thou shalt not steal" was never given.

A good plan is to mark your tools with a distinctive punch mark, so that it will only be seen on close examination. The thief, thinking they are not marked, may after a while be bold enough to use it openly when you are around. And if you should catch him?

The common method is to use an etching liquid; a good mixture is made as follows: Mix 1 oz. sulphate of copper, ¼ oz. of alum, and ½ a teaspoonful of salt reduced to powder, with 1 gill of vinegar and 20 drops of nitric acid. This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the surface, according to the time it is allowed to act. Cover the parts you wish to protect from its influence with beeswax, tallow, or some similar substance.

Some desire something a little more elaborate, so as to give a design or lettering more even than scratching in the wax by hand.

The method used by wax engravers could be used with success. When any lettering is to appear on a wax cut, they moderately heat ordinary printers' type and press these into the wax, the warm type being easily pressed to the plate or surface of metals to be etched. Designs of which cuts have been made could be used in the same manner.

Mr. B. F. Brown describes the method he uses as follows:

First, take sandpaper or whetstone and clean off all rust, gum or dirt, from the place where the lettering is to be done; then cover the metal with a thin coating of beeswax or tallow, then take a pencil or any sharp-pointed instrument and do the marking through the wax, being careful to have all the letters go through and removing all the wax from the bottom of the letters. Next, take a fluid made from equal parts of common salt and bluestone and water, and by dipping your pencil in the fluid fill all the letters in the wax.

If you will do the work nicely you will appreciate it and by the time you have finished your work the acid has finished its work, and you can clean your tool and see what you have done.

A HINT ON HOLDING THE RULE

The rule, one of the most essential tools of a carpenter, can be used with very little difficulty. Most of the carpenters that I have observed always laid their rules flat on

the board that they were measuring. It will be readily seen that if some one should come along and push him, as is very frequently the case in a carpenter shop, his rule would slide and he would have to do all his measuring over again.

In the illustration of Fig. 1 I try to show how this may be avoided.

Instead of putting the rule directly on your board, place the edge of the rule against the side of the board, holding it with four fingers and placing the thumb on the opposite

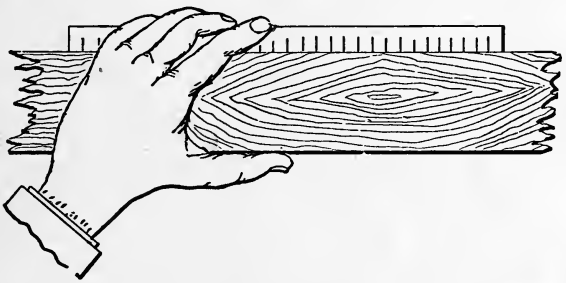


FIG. 1

side. In this way you have full control of your board and rule, and in case you are pushed by one of your fellow workmen, the arm, hand, rule and board all go in the same direction, and will not necessitate doing the work over again.

PROTECTING THE STEEL SQUARE

The most important thing in regard to a square is to keep the tongue and blade at right angles to each other, and therefore it is a good plan to put a "shoe" on the

corner or "heel" of the square, as shown in Fig. 2. To make this, take a piece of heavy sole leather, soak it in water until quite soft, and bend it so as to fit the heel. One edge was sewed as shown at A, and through both thicknesses I punched a hole at B through which a piece of strong twine could be passed and tied so as to prevent the

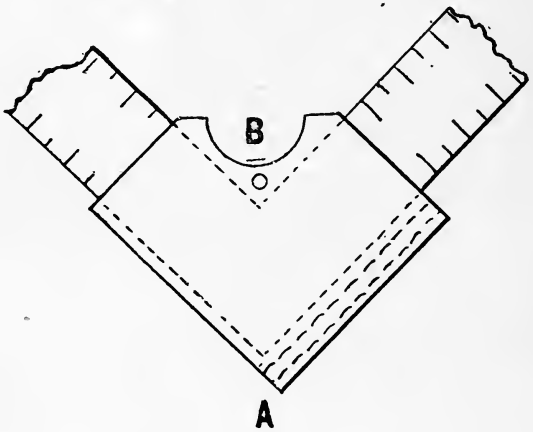


FIG. 2

shoe from slipping off. The corners above B were cut as shown, so that the twine might not slip. I have found this little contrivance very useful.

FILING SAWS

The grand secret of putting any saw in the best possible cutting order consists in filing the teeth at a given angle to cut rapidly and of a uniform length, so that the points will all touch a straight-edged rule without showing a variation of a hundredth part of an inch. Besides

this, there should be just enough set in the teeth to cut a kerf as narrow as it can be made, and at the same time allow the blade to work freely without pinching. On the contrary, the kerf must not be so wide as to permit the blade to rattle when in motion. The very points of the teeth do the cutting. If one tooth is a twentieth of an inch longer than two or three on each side of it, the long tooth will be required to do much more cutting than it should, and the sawing cannot be done well. Hence the saw goes jumping along, working hard and cutting slowly. If one tooth is longer than those on either side of it, the short ones do not cut, although the points may be sharp. When putting a cross-cut saw in order, it will pay well to dress the points with an old file, and afterwards sharpen them with a fine whetstone. Much mechanical skill is requisite to put a saw in prime order. One careless thrust with a file will shorten the point of a tooth so much that it will be utterly useless, so far as cutting is concerned. The teeth should be set with much care, and the filing should be done with great accuracy. If the teeth are uneven at the points, a large flat file should be secured to a block of wood in such a manner that the very points only may be jointed, so that the cutting edge of the same may be in a complete line or circle. Every tooth should cut a little as the saw is worked. The teeth of a handsaw for all sorts of work should be filed fleaming, or at an angle on the front edge, while the back edges may be filed fleaming or square across the blade.

The best way to file a circular saw for cutting wood across the grain is to dress every fifth tooth square across and about one-twentieth of an inch shorter than the others, which should be filed fleaming at an angle of about forty degrees.

The following don'ts are by E. C. Atkins & Co.:

DON'T bend or twist a hand or rip saw. They are made to saw straight lines with, and not circles.

DON'T forget that a handsaw has a spring temper, and, like a spring, if overstretched, will kink or snap.

DON'T set your saw below the teeth. The set should be on the tooth and not on the blade.

DON'T forget that the less set you give a thin-back saw the easier it will run.

SAW HANDLES

It is the practice of some carpenters to allow their saw handles to become loose. The other day I picked up a saw the handle of which was so loose it rattled. Now, this is all gross carelessness, for everyone should know better than to abuse his tools in this way. I cannot believe that a man will ever become a finished workman who keeps his tools in such shape, says Fred. Black.

STRAIGHT CUTTING SAWS

The most exasperating thing in using a saw is to try to cut a rake or a thick piece of wood and have the saw cut

in a curve, instead of a straight line. A fast or smooth-cutting saw is a pleasure, but a straight-cutting saw is a necessity, says S. M. Lain.

I have read several books on saws and their care, but feel that the most important points were gained by experience. The following is part of the experience, and some may profit by it:

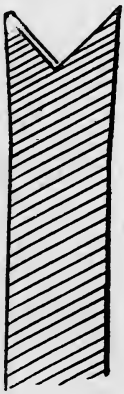


FIG. 3

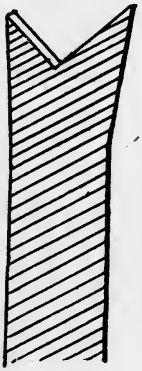


FIG. 4

In sharpening a saw which is dull, and not in shape to need new teeth filed in it, set the teeth first (if setting is necessary). Then joint by filing the points of the teeth *square* with the blade until each tooth is touched with the jointing file. Leave the teeth a little longer in the center, with a very slight gradual curve toward each end. It is sometimes necessary to saw in the center of a plane surface, and the ends would scratch if the cutting edge was straight. There are a number of other reasons also. Then file the teeth at an angle to suit the user of the saw. I

have decided the factory filing—or the angle at which the teeth are filed when new—is the best for general purposes. When filed at too much of an angle, the saw has a greater tendency to saw crooked. File the teeth to an even size and angle till the points are sharp. If this process is done *accurately*, you have a true-cutting saw—but the perfect filing is the exception or the accident.

A very simple and effective way to test a saw after filing is to take a board 12 in. wide and start the saw straight, letting it cut as it will, holding the handle loose in the hand, using the whole length of the blade. Take a steel square and try the cut; if straight, the saw is "good enough."

If it has run either way and the cut is not straight, it is because the teeth are longer on the side it has run (see Fig. 3), or it is set more on that side (see Fig. 4).

The teeth should be straightened by refiling or—if not too bad—an oilstone rubbed flat with the blade on the side which is longest will cause it to cut straight.

Machine rip and cross-cut saws will run in the same manner from the same causes. It is not as noticeable, but the saw dulls faster, heats, or the boards are drawn from the guide.

Try the test, Brother Carpenter, and see how often you have a saw that is "good enough" with the first filing.

HANDSAW SERVING IN THE PLACE OF SEVERAL OTHER TOOLS

Many people have heard about "The Steel Square and Its Uses," etc., but very seldom do you hear about *the handsaw and its uses.*

However, the handsaw is a tool that sometimes comes very handy to use in other ways than to saw in the ordinary fashion, as is explained by Mr. Emery H. Chase as follows:

I will mention a few good uses—very good uses; also a way to shape the point of a saw so a mechanic can keep one in his kit which will come very handy many times.

To begin with, the handsaw can be used as a square, and save the use of that tool very often in rough work. When starting to saw a board or scantling you will notice a reflection in or on the side of the saw blade that will indicate or seem to show a continuation of the edge of the board in a straight line—that is, when the saw is cutting squarely across; but let the saw be turned the least bit out of square, and the reflected edge of the board will instantly show a bend or angle. This is a quick and easy way of cutting square—and you can puzzle many a mechanic with it.

Now by the same means you can use the saw as a bevel or mitre square. For instance, to cut what is commonly called a "45,'" or square mitre: It is quite easy for any one to guess a square; many people can get it very close. When

the saw is pointed in the right direction to cut a square mitre, the reflection will show a square. See Fig. 5. While these methods cannot be used much for fine work, they have the merit of quickness that comes in play hundreds of times to every mechanic.

The workman who sees a "45" cut in this way will wonder how you get it so close without a line—he cannot see you looking at the reflection, although closely watching you.

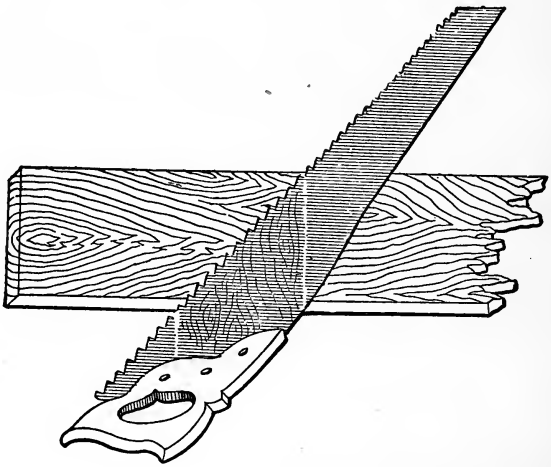


FIG. 5

One day I saw a fellow try to saw with the point of his saw in the flat side of a board, and I noticed he could saw quite deep, and only one or two teeth were cutting. So I said to myself, if the point of the saw were rounded and teeth were cut in it, it ought to saw deeper; so I tried it, and it worked fairly well, except that it would "catch" or suddenly stop when shoving it ahead. To avoid this

I filed those teeth on the rounded point so they would cut when the saw is drawn, and this I found to be the best of all. I found I could easily cut through an inch board by having a stroke of only two and one-half inches. And so I keep the saw in my chest, and I find it comes useful very often. Only the other day I had occasion to cut a trap door through a floor, and, having to use the same pieces sawed out for a new door, I did not want to bore through to start the saw, as it would have spoiled the boards on one side of the saw kerf at least, and necessitated the trouble of procuring other lumber.

So you see the handsaw in this instance will take the place of brace and bit and compass saw. The point of the saw should be jointed off so the beginning of the curve will be about two inches from the end of the saw, and it should be similar in shape to a sled runner, so that it will look as shown in Fig. 6.

A HANDSAW HINT

Mr. Emery H. Chase writes that to cut across the narrowest amount of wood is the most effective, or at least the most rapid way of cutting with a handsaw. This fact is not generally recognized; or to be more precise, it is usually ignored.

For instance, let a six-inch board be sawed flatwise; that is, so the board will be cut across the broad side; then afterward turn the board up on edge and cut it off

by sawing the short way through it. It will be found that on an average the board can be cut in two much quicker when the teeth pass the short way through the board.

Therefore the lesson to be thus learned is, that when sawing a large piece of wood, to so use the saw as to avoid the teeth all touching across a broad surface at once, and to contrive to make as short a cut as possible. In order to do this in the most practical manner, a piece of timber of very considerable size should be cut by beginning at one corner and sawing to a reasonable depth. As at *A*,

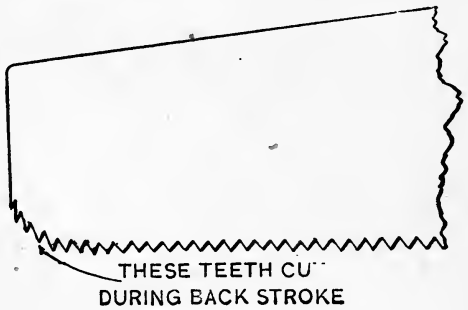


FIG. 6

Fig. 7. Then change the slant of the saw so the timber will be cut to the line *B*; then, as the cutting edge of the saw will begin to touch a wide surface, again shift the saw to another position, or slant, and cut inward to *C*, and so on *D*, *E*, *F*, etc., in their order, as shown. In this way the timber will positively be cut in two one-quarter to one-half quicker than as if it were kept at one angle all the way through. Anyone who doubts this can easily ascertain for himself by the simple method of trying it.

The same is true in rip sawing. The most rapid and usually the best results are obtained by constantly changing the pitch or slant of the saw from low to high, and vice versa.

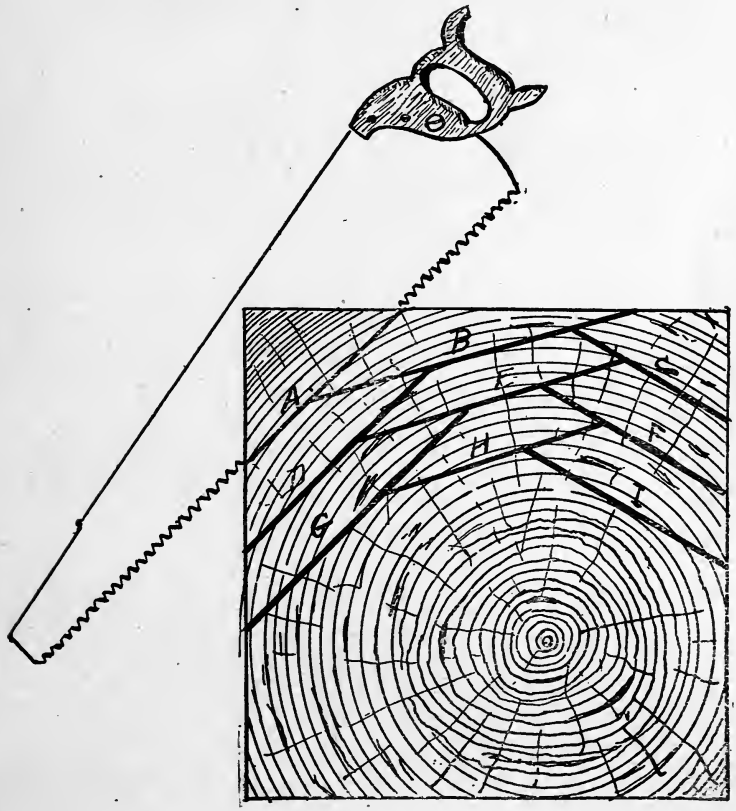


FIG. 7

This is a method always or nearly always practiced by well-experienced men, but which generally escapes the observation of beginners until they acquire it unconsciously.

The point seems to be thus developed that the fewer tooth-points that are cutting, the faster the saw will cut;

because of the deeper penetration of each tooth under a given amount of pressure. This is also in keeping with the fact that the cutting speed of the different kinds of saws is about in proportion to the spacing of the teeth; from the handsaw to the cross-cut (woodsman's) saw and up to the circular or bandsaw.

While in the accompanying diagram a large piece of timber is represented, it should be remembered the same rule prevails if only the cutting of a two-by-four is considered.

A HACKSAW HINT

Although the hacksaw is principally an ironworker's tool, it is very useful to every carpenter, and in the following Mr. Emery H. Chase describes a little kink on how to easily make almost twice the usual speed in cutting off shafting and other large irons.

Almost everyone knows how brittle the hacksaw blade is—will break almost like an egg shell—and you will notice that the blade is very thin; but the teeth have been given a wide set which makes a saw kerf about as wide as that of an ordinary handsaw. This the manufacturers have to do because of the saws being used by all kinds of people with varying degrees of ability in running the saw in true line.

And in a narrow kerf if the saw be given a short twist it will quickly snap in two. But if the saw were sure to be used only by men who can run it in a straight and

true manner the set could be much less and the saw would cut correspondingly faster.

A wide set means the removal of more metal than otherwise needed, in order to give more play for the saw. It also means the more metal taken out in the saw kerf, the slower the saw will cut. This principle is the same in wood; the more saw dust you make the slower your saw will cut.

When you have one or several hours' work in cutting a large piece of iron, just lightly and evenly touch the sides of your hacksaw blade to the side of a revolving emery wheel, removing as near as you can two-thirds of the "set." Your hacksaw blade will then just about make room for itself, but will cut fully as fast again.

Of course you must have a good chance to run the saw true and must be careful to do so, for a slight kink will now cause a broken saw blade.

It is easier to run a saw true in a large piece of iron than in a small piece, but this also is just where you want the saw to cut fast without extra labor.

Save your thin blade for large irons and use an ordinary one for the smaller ones.

BANDSAW HINTS

Don't forget that small teeth, and lots of them, help to do smooth work just the same on the bandsaw and the circular as they do on the handsaw of the carpenter, says

a writer in *The Woodworker*. Another writer in the same excellent paper has the following remarks to make on scroll work with the bandsaw:

Of all the uses to which the bandsaw can be put, none is more fascinating than scroll work. Whenever it can be employed for that purpose, one should not hesitate a moment in giving it preference over the jig saw, as the work can be done quicker and be of a far superior quality. Our experience with a jig saw has always been, no matter how fine or narrow the blade, that the edges on the under side will be torn and jagged, which, to say the least, detracts materially from the appearance of a job. Nor is it hardly safe to cut close to the line, because, on account of the jerky motion of this saw, it is liable to run away in the wrong direction. In using the bandsaw, however, one has nothing of this kind to fear. The edges are invariably regular and smooth, and one may cut right up to the line without any danger of the saw running off on a tangent. He must be either an unskilled or slovenly mechanic who would allow any such slip to be made; there is no need of it whatever. A man who understands how to handle a bandsaw knows well enough that the work done by this machine, if carefully attended to, will need no touching up with either chisel or gouge. In fact, a little sandpapering will make the edges as smooth as the best of trimming can.

To secure this result two things need to be kept constantly in mind. First, the blade used must be narrow, with

moderately fine teeth. With such a blade all kinds of curves, even the sharpest, can be followed with ease. The whole responsibility rests upon the man manipulating the piece of wood. If he traces carefully his line, the work will be well-nigh faultless. Second, the saw should by all means be kept sharp. This should be laid down as a fixed rule not to be deviated from, and the observance of which is especially necessary in doing fancy and intricate scroll work. A dull saw never cuts, but scrapes its way through the wood, leaving usually a rough, fuzzy edge. Only from a sharp saw can the best results be obtained; then the cut will be smooth. Now, I imagine some of your readers will say: "I agree with you that so far as sawing along the outside lines of a piece of scroll is concerned, there is nothing comparable to the bandsaw. But what about cutting out the inside spaces?" With rare exceptions, even these can be cut with the bandsaw. Many a fancy piece have I cut out entirely by the use of this machine alone. Take the bracket shown in Fig. 8 as an illustration. To cut this out get a piece of wood wide and long enough for the scroll part proper, plus the straight piece at the top. Then you can proceed to saw all this out, with the exception of space *A*. To get at this, make a cut with the saw at *a b* lengthwise of the grain, then follow the inside line, and cut will be accomplished in a "jiffy." After withdrawing the saw, a thin sliver of wood, the same in thickness as the blade, can be firmly glued into the cut, making the piece as solid

as ever. Last of all, glue on the straight strip *c d* to form the back of the bracket, and the job will be complete, in appearance quite neat and clean.

In our line of work we never use the jig-saw except as a last resort. The work it does never proves satisfactory, for reasons we have already stated. In fact, only in cases where we cannot possibly contrive to cut out the inside

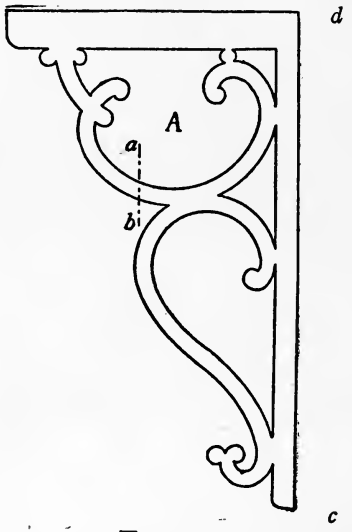


FIG. 8

spaces with the bandsaw do we ever think of using it. These instances, however, are very rare, for by means of some device or other we always manage to get along without it. For nice, neat, attractive scroll work our old, reliable friend, the bandsaw, cannot be beaten.

One can often bandsaw two or more thicknesses quicker and better than one, and can generally nail the pieces together, outside the pattern, in such manner that the nails

will hold them till the last cut is made. Nailing inside the pattern is not only open to the objection that it mars the work, but pieces at all slender are liable to be split in taking them apart.

SAW FILING VISE

Mr. Dan. J. Dodrill gives the following sketch of a saw filing vise that can be very easily made:

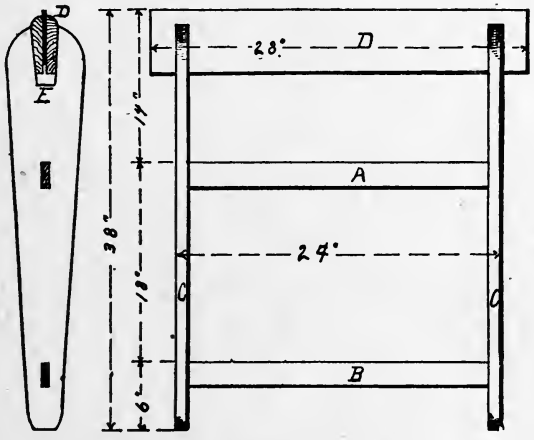


FIG. 9

As will be noted in Fig. 9, the saw is put in between two pieces of board 4 inches wide, 28 inches long and about 5/8 inch thick, as shown at *D* on sketch. *B* on sketch is a foot-rest, and *A* is the knee-rest. *C C* are made of $2 \times 4 \times 38$ inch pieces. *E* is a wedge-shaped opening, so that the saw in between *D* can be pressed in, thus holding it firmly.

Pieces *A* and *B* should be mortised in end pieces so as to make the thing solid. When in use lean the vise against

something, put the saw in, place your foot on the rest *B* and your knee against *A*, and file away.

SHARPENING PLANE IRONS

To do good work with a plane the iron must be kept sharp, but frequently the iron is dull and stubbed. When in this condition it is impossible to keep the cutter sharp, for the least wear on the cutting edge would be sufficient to render the tool dull and incapable of doing good work.

FIG. 10

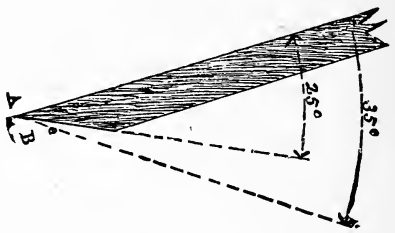


FIG. 11

I show in Fig. 10 the shape of a cutting iron as I found it. Now, by examining this figure, it will be seen that the cutting edge, *A*, when pushed forward, will work more like a scraper than a cutter, owing to its stubbedness, and that in fact the back of the basil—*i. e.*, the bevel of the iron at *B*—pressed against the wood at the back of the cutter, thus preventing it from performing its proper duties. To make this cutter right and capable of doing its duty, I ground the tool until the basil assumed the shape as shown at Fig. 11.

It will be seen that the cutting edge at *A* is more acute than at Fig. 10, and that the basil, *B*, in Fig. 11, is longer than at Fig. 10. It will also be noticed that on Fig. 11 there is a second bevel, *e*. I explained the use of this second bevel to my friend as being quite necessary to insure good and effective work. I repeat the explanation here: If a cutter is ground down to its cutting edge, so that the line of the basil forms an angle of 25 degrees with the face of the tool, as shown at Fig. 12, then by examining the cutting edge, *B*, it will be seen that it presents a very weak sec-

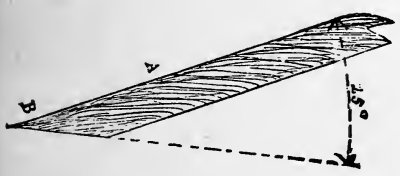


FIG. 12

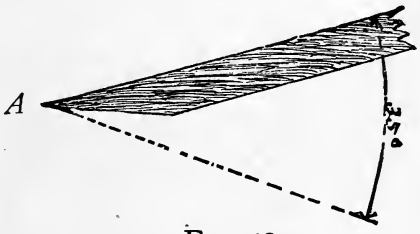


FIG. 13

tion, much too weak to be lasting or of very much service. Indeed, a plane iron or chisel intended for general use, ground to this form, would be apt to crumble or "nip" out on the cutting edge, or if the temper is so fine that no crumbling takes place, the chances are that, in the case of a plane iron, it will "chatter" or spring and shake during the operation of cutting; this makes the work wavy and full of transverse ridges, thus rendering the work unsatisfactory. Notwithstanding these defects, it has been ascertained that an angle of 25 degrees is the proper one to employ when grinding tools for wood-working. To guard

against the defects mentioned, a second basil is made at the cutting edge at an angle of 35 degrees, as shown at *A*, Fig. 13. It will be seen that by this method all the defects of the thin cutting edge are avoided, and all its advantages maintained. In grinding, care should be taken to avoid finishing down to the edge, for if such is the case the edge would be ragged and broken up and would have to be whetted down on the oil stone a full thirty-second of an inch before the cutter would be ready for use.

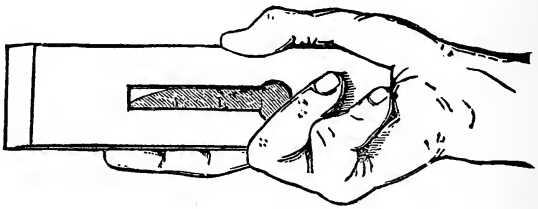


FIG. 14

In grinding tools of this character, the stone should revolve *from* the operator; that is, the top of the stone should move away from, not towards, the tool. This gives the operator better control of the work, and gives him an opportunity to see when to cease grinding, which should occur when the basil is brought to within about a thirty-second of an inch of the edge. The process of sharpening should be completed on the oil stone at an angle of 35 degrees, as shown at Fig. 13.

This second basil need be no more than a sixteenth of an inch from the cutting-edge to its termination on the line of basil; a thirty-second of an inch is quite enough for the

first few whettings after the tool is ground. Another thing I warned my friend against, and that was making a rocking motion of the hand while whetting the cutter, as this motion has a tendency to give the basil a convex or rounding shape, something like that shown at Fig. 10, which after a while destroys the cutting qualities of the edge. During the sharpening process on the oil stone the tool should be held firmly in the hand, with the thumb on one edge and two

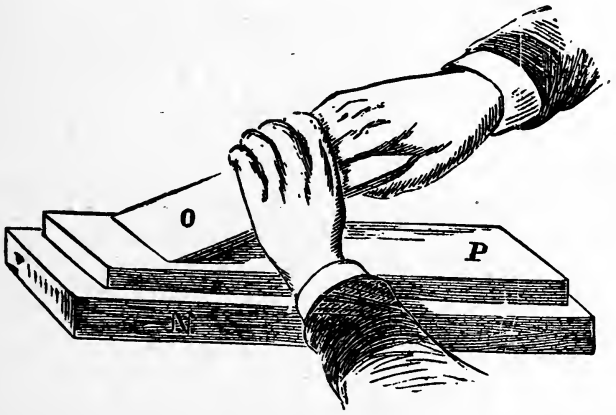


FIG. 15

forefingers on the upper side of the iron, as shown at Fig. 14, with the end resting against the ball of the hand. The tool should now be placed on the stone and the left hand brought over and pressed on it, as shown at Fig. 15. Sometimes the operator will find it more convenient to rest the three forefingers of the left hand on the iron while sharpening; on the whole, however, I prefer running the hand over, as shown in the illustration, as it enables one to take a very firm hold of the tool. With chisels, gouges, and

other handled tools, it is better to lay on the fingers of the left hand than to grip it with the fingers, as it is not absolutely necessary that the cutting edges of these tools should be in a right line, or strictly at right angles with the edges of the iron. With plane irons this is different; the cutting edge *must* be a right or straight line, and at right angles with the edges of the iron on the smoothing-plane, fore-plane, and long-jointer, but it is not necessary to be so particular with the jack-plane; indeed, it is sometimes better to leave the edge of the cutter a little rounding, as it works better than for roughing off stuff and preparing it for the finer-working planes.

Another very important matter is the taking off of the corners of the plane irons, so as to prevent the tool from leaving marks on the work, which will be the case if not provided against. It will be seen by examining the iron, *O,* Fig. 15, that the corners show clear and acute. Now, if the cutter, *O,* is tipped up a little on the oil stone, *P,* and the corners gently whetted off, the iron will cut sweetly and smoothly without having its efficiency reduced in the least.

SOME PLANING HINTS

I wonder how many of our young carpenters, who have used the old-fashioned wooden planes and have become disgusted with them, know that dressing them down with a good steel bottom plane will make them as good as new, says Mr. E. S. Frye.

To do this remove the bits and handle and lay stock on a level bench, or in a vise, with bottom side up, and plane down smooth and true with a steel bottom plane. Leave it set in linseed oil for ten or twelve hours.

The following ideas have been submitted by Mr. C. G. Curry:

Fig. 16 shows the face or bottom of a wood-bottom plane, and, as all my brothers know, the throat becomes too large from wear and the plane does not, in consequence, work well and chokes up readily.

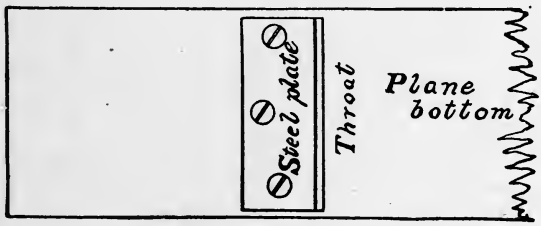


FIG. 16

I have fixed wood planes in the following way: Take a piece of thin steel, or one-half of a door hinge, and set it in the bottom flush with the face of the plane, as shown in Fig. 16, so as to partly close the throat, and you will be surprised how much better the plane will work.

The above has been my own experience. I would like to see some letters from brother carpenters stating their opinion as to which they like the best—wood bottom or iron planes. This is quite an important question in the minds of some mechanics. Also which is the best—the light,

thin plane iron or the heavy cutters, especially for jack planes or jointers? For my part I prefer the heavy plane iron thickest on the cutting edge, as they do not jump or chatter in the knots or hard places.

I also think that most of the plane irons are tempered a wee bit too hard.

Mr. L. M. Hodge remarks that every carpenter knows how difficult it is to make a perfectly smooth and even surface on a cross-grained, knurly or birdseye board when there is nothing at hand but a common smoothing plane to do it with, when used in the ordinary way.

In smoothing certain kinds of curly redwood and like materials it is next to impossible to so sharpen and set a bit in the usual way that a smooth and even surface can be obtained, and again it is quite difficult to use a hand scraper on it and keep the surface even and true, as the instrument having no guide will catch on the grain of the wood and gouge out the soft parts to a greater or less degree, be the operator ever so careful. Now these difficulties can be readily overcome by smoothing the wood as well as possible in the ordinary way with a sharp plane set fine, then put a smooth keen edge on the smoothing plane bit and leaving off the cap insert it into the stock bottom side up. Of course the bit must be set very fine for difficult and very smooth surfaces and the corners rounded just enough to keep them from leaving sharp impressions in the wood.

It will be seen by reversing the bit as above described

that the upper or front surface is caused to stand at an angle of about 80 degrees instead of 45 degrees, as when inserted in the usual manner, thus converting it into one of the finest surface scrapers that could well be imagined.

While the above may seem very simple, still it may be a pointer that will assist some of the younger "chips" over a rough spot.

OIL STONES

The oil stone plays such an important part in keeping edge tools sharp that it will be best to say something on this subject here.

The reader has no doubt noticed that the oil stone *P*, in Fig. 15, is surrounded with a wooden case, *N*. This case serves a twofold purpose: it protects the stone from breakage, and tends to give it weight and solidity while being worked upon. To make this case, a piece of dry pine should be obtained, about 1¼ inch thick and about 1 inch wider than the stone, and from 1½ to 1¾ inch longer than the stone. A recess is then made from a half to three-quarters of an inch deep, according to the thickness of the stone. A cover should also be made of wood, to fit loosely over the stone, and which might have its corners bevelled off to give it an appearance of lightness.

The best Washita oil stones are white, although all of the white stones are not good whetstones. The value of a stone depends upon the hardness, weight and the sharpness

of the grit, which are the result of the character of its crystallization. Every good Washita quarry has its own peculiar form or manner of crystallization, and the stones from certain quarries only produce the best sharp cutting and durable oil stones.

Washita oil stone rock is crystallized silica. The crystals are very small, and are formed in clusters with point ends interlaced, leaving numerous cavities. These minute crystals are hexagonal in shape, with sharp points, and can be seen under a microscope when magnified about a hundred times. They are harder than steel, and that is why whetstones cut from this rock will wear away and sharpen steel tools. Washita whetstones are called oil stones, because oil must be used to fill the cavities and float away the steel particles that are cut off the tools.

The peculiar geological formation from which these rocks are taken is not known to exist outside of the state of Arkansas, where it occurs in many of the mountains of Saline, Hot Springs, Garland and Montgomery counties. These strata are in a vertical position, varying from nearly perpendicular to nearly horizontal, and have been considerably broken up by upheaval or folding of the earth crust.

The best Washita oil stones for carpenters weigh about $1\frac{1}{4}$ to $1^{5}/_{16}$ ounces per cubic inch, and a stone of standard size, $1\frac{1}{8} \times 2 \times 8$, should weigh about 1 pound $6\frac{1}{2}$ to $7\frac{1}{2}$ ounces.

By continual use the stone will show the wear more

at the ends than at the middle. This is due to the tool being reversed. When the stone is uneven, a good job of sharpening cannot be done, so the thing to do is to level the stone.

There are many ways to do this, and among them all the best and quickest is to take a sheet of No. 1 or 1½ sand paper and place it on a board, fair and straight. Then rub the stone back and forth until level. Two or three sheets of sand paper are sufficient.

A writer in *The Pattern Maker* says that a handy method of quickly reducing parts of a stone which stand too high, or improving the form of a worn slip, is to scrape it with the edge of a piece of glass, used in the same way as a steel scraper is used on wood. A piece of glass can always be obtained when perhaps the ordinary methods of rubbing down are not available or would take too much time. The stone can be scraped in this way either with or without water. Without water is perhaps the best, as it is then easier to see how much is being removed. If one end or one corner of the stone stands higher than the rest, it is easier to reduce to a general level in this way than by the ordinary methods which make the surface flat, but cannot easily remove a slope to one end or one side. A slight inclination in any direction causes the oil to run off the stone, and it is advisable, therefore, always to leave the stone slightly hollow so that the oil will tend to run to the middle when it is left standing.

HOW TO USE A GRINDSTONE

Common grindstone spindles, with a crank at one end, are open to the great objection that the stone will never keep round, because every person is inclined, more or less, to follow the motion of his foot with his hand, which causes the pressure on the same to be unequal. The harder pressure is always applied to the very same part of the stone and will very soon make it uneven, so that it is impossible to grind a tool true. To avoid this, put in place of the crank a small cog-wheel of thirteen cogs, to work into the former. The stone will make about 0.7 of a revolution more than the crank, and the harder pressure of the tool on the stone will change to another place at every turn, and the stone will keep perfectly round if it is a good one. This is a very simple contrivance, but it will be new to many of our readers.

Another point is mentioned by Mr. Fred Black, and that is when you grind edge tools, be very careful to use plenty of water on the stone, for it does not take very long to draw the temper in the tools. If they become heated, they will be brittle, and the edge is liable to break off.

SHARPENING SCRAPERS

How should a scraper be sharpened is a question asked even by some old and experienced carpenters. The following directions by Mr. S. M. Lain answer this question:

Most all cabinetmakers understand the process of

sharpening scrapers and find it an indispensible tool. It is just as useful to carpenters in a great many places.

A cabinet scraper is a standard tool and can be purchased at most every hardware store. They are not sharp when sold, but need to be sharpened then and quite often afterward. Now for the process:

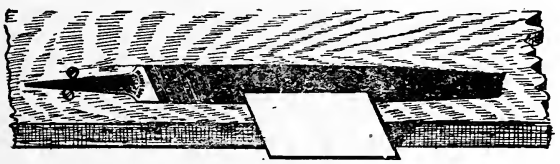


FIG. 17

Fasten a file flat on the bench by means of a few screws and file the scraper until the flat sides are straight and free from rust or uneven bumps, Fig. 17. In this process file both sides of the four edges. Then file the sides and ends square across, Fig. 18, until the edges are straight and have a slight wire edge. Jointing edges may be done

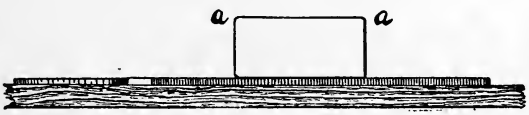


FIG. 18

with a handsaw jointer. Round the corners slightly, as shown at *a,* to keep the scraper from digging into the wood.

The burnisher can be purchased at some hardware dealers or may be made out of a round file. Grind the file smooth and polish it on an oil stone. Sometimes gouges are hard enough to be used for burnishing.

After filing lay the scraper flat on the bench and rub the burnisher on the sides parallel to the scraper, Fig. 19, and press down *hard*. Take the scraper in one hand and hold on one edge on the bench; press burnisher square across the vertical edge and rub upward *hard,* Fig. 20.

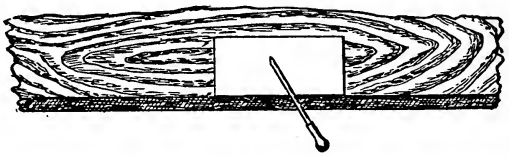


FIG. 19

Rub square across twice, then turn the burnisher slightly toward each side and rub upward hard twice, Fig. 21. Repeat the foregoing process on all four edges. The scraper may be fastened in a wood vise and both hands used to burnish edgeways.

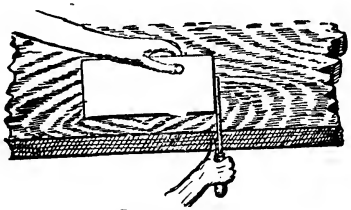


FIG. 20

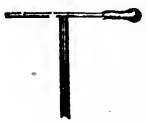


FIG. 21

If a very smooth edge is required rub the corners of each edge smooth on an oil stone before turning.

An experienced person seldom gets eight good cutting edges, so a beginner should not be disappointed if all eight do not cut.

Enlarged illustrations will make it clearer. All know the reason for sharp square corners. Rubbing the burnisher

on the sides gives a larger edge to turn back, as shown in Fig. 22. If the burnisher is held at too much of an angle the edge cannot catch when the scraper is held at an angle to suit the hand, see Fig. 23. Too much rubbing with the burnisher will cause the edge to turn too far also.

FIG. 22

A heavy cutting edge may be obtained by grinding the scraper to a bevel and sharpening on an oil stone. Just turning one way is all that is needed. Fig. 24.

A very good scraper for taking off glue, varnish and paint; also for scraping the rough off of floors, etc., is a

FIG. 23

FIG. 24

flat piece of steel (a buggy spring or file will do) drawn thin and bent at an angle of about 45 degrees. Fig. 25. File smooth on the inside and then bevel to an edge on the outside. They will do very well at first without turning the edge. When dull from filing, only sharpen by first turning edge out, then turn it in to a cutting angle. Fig. 25.

A scraper when dull may be sharpened by the process shown in Figs. 19 and 20. In Fig. 19 hold the burnisher

at an angle to the edge and rub outward as shown by the arrow in Fig. 26.

FIG. 25

FIG. 26

The second and third turnings are sometimes better than the first after filing. One filing will last for about four turnings.

USE OF DRAW-KNIFE

Mr. R. D. Osterhout says that he finds in using a draw-knife that by working it with the beveled side next to the work it makes a smooth job. If the material is good the piece may be made almost as smooth as if a plane had been used to finish it. This may not be new, but all the carpenters I have talked to about have never tried it.

DRILLING OVERHEAD HOLES

Anyone who has ever had occasion to drill holes in a ceiling, or any other place where the job has to be done overhead, knows what tiresome work it is, says A. J. Saxe, in *Popular Mechanics*. A strong man will feel exhausted after holding his arms overhead for five minutes without doing any work, and when the work of feeding and turning the drill is added, it is almost impossible to continue working for more than three or four minutes at a time.

Having had occasion to do some overhead drilling, I found that the men's labor could be greatly reduced by means of the device shown in Fig. 27, which consists of simply a board, which acts as a lever, with the fulcrum at the round of the ladder. The board to work well, should be in a horizontal position, and if the round is not in the right place, it may be changed by moving the lower end of the ladder, or if this will not produce the desired effect, a few blocks of wood placed between the brace and the board will bring the board to a horizontal position. The pressure should be applied to the board as far from the round as possible, thus increasing the leverage.

FIG. 27

When the ladder is inclined too much it is hard to reach the handle of the brace. In that case the brace can be placed on the other side of the ladder and the board can be raised by placing your shoulder below it.

HINTS ABOUT PLUMB-RULES

Beginners who have had but little experience in the practical use of spirit levels and spirit plumb-rules are apt to suppose that they can work more accurately with a spirit level or plumb than with a plumb-bob and line. A spirit rule is a little more convenient in most instances,

and when used by a mechanic of extensive experience and quick discernment one is to be preferred to a plumb-bob and line. But a good bob and line rule will enable a workman to plumb his work with more accuracy than he can do it with most spirit plumb-rules. A bob and line rule will indicate a deviation equal to one-sixteenth of an inch from a perpendicular line in the height of a door frame, while such a slight inclination would not be shown by the best spirit rule we have ever seen. Besides this, the glasses or vials of spirit levels are not always of the correct form to be affected by a trifling variation from a level or a perpendicular line. We have frequently met with spirit rules which would not indicate the inclination of a door frame when it leaned more than one-fourth of an inch from a perpendicular line. Yet beginners, who have not the money to spare for a spirit rule, fancy that they can work with far greater accuracy with such a rule than with a plumb and line rule.

After long experience in using both kinds of rules and levels, our preference for ordinary use is decidedly in favor of a bob and line rule made as follows: Procure a piece of clear-stuff pine four feet long, four inches wide, and an inch thick, joint the edges parallel, and strike a gauge mark along the middle; then cut a hole near the lower end for the plumb-bob to play in. This opening should be at least three inches wide, and of an oval form.

Instead of paying fifty or seventy cents for a brass

bob, make a neat one of lead in the following manner: Break a hole in the small end of a hen's egg-shell and make a pin-hole in the other. Then blow out the contents, wash the inside of the shell, dry it, bury the shell in sand or loam, pack the sand firmly around it, then pour in melted lead until the shell is full. Before the lead becomes solid, hold the ends of a small wire staple in the upper end of the plumb-bob. This will make a neat, true and cheap bob. Procure for a line a strong piece of clock-cord, oil it with linseed oil a few weeks prior to the time of using it, so that the strands will not unwind, and you will have a plumb-rule that will be as accurate as "the left-handed Benjamite who could sling stones to an hairsbreadth and not miss." For setting door frames and plumbing studs, a rule not less than six feet in length should be employed. Then the work will be plumb.

SPIRIT LEVELS

No doubt many readers will be interested to know the method of making the spirit level glasses.

There are two qualities of spirit levels in market: The best kind has the tube carefully ground out on the inside, so as to make it true; the common kind is made from carefully selected glass tubing, just as it comes from the glass works.

The tube is sealed at one end by the ordinary method well known to glass blowers, and the other end, after being softened in a flame, is drawn out to a fine tube, which is then broken off and left open. The air in the tube is then expanded by heat and the point of the fine tube plunged beneath the surface of some alcohol. When the tube cools, the air contracts and the alcohol is forced in by atmospheric pressure. By repeating this process the tube can be filled as full as is desirable. It is then held upright and the fine tube is closed by the flame of a blowpipe, and all that is not wanted is broken off.

HINTS ON HOME-MADE TOOLS

Mr. Emery H. Chase contributes the following useful hints about home-made tools:

There are quite a few of the most useful tools the carpenter uses that are home-made, for the reason that manufacturers are slow in producing everything the carpenter wants. And so you can't find them listed in catalogues, but must proceed to the blacksmith or make them if you wish to have them.

Still another useful thing in my chest is the very fine and thin saw. I, of course, could not buy one, so I took a corset steel $\frac{5}{8}$ of an inch wide and about ten inches long and filed 14 teeth to the inch and did not set it. It works finely. I use it in pattern making; the main object of its use is to avoid much width in the saw kerf. It

leaves a kerf only wide enough to admit thick writing paper, and cuts smoothly and rapidly, and two pieces sawn in two with this saw and then put together again do not lose much of their original dimensions from the thickness of the saw kerf. It has to be used in a hack-saw frame, however. Just try it though!

Another useful saw, which fitted in proper shape for use, is not for sale so far as I can learn. That is a square-hole saw. Disston sells one, but the angle blade or portion that "turns the corner" is so blunt and increases in width so fast that it is almost impossible to use it in an inch board.

After cutting away one-half of this blade and filing new teeth in it and causing the edge to leave the main blade very gradually, it will work all right. To use a saw set on it is quite a difficult matter, however.

Another useful thing I tried and that is ridges or corrugations running around the hammer handle to keep the hand from slipping, especially when striking hard blows and nailing at a distance. The ridges are like those on the handle of a policeman's club. They should be turned right on the wood when the handle is made. Just carve one out, and you will see how nice it works.

Fishermen have good fishline reels; but a good and rapid-winding carpenter's chalkline reel is something not yet dreamed of by the manufacturers. One kind in which the awl can be placed and the line unwound rapidly is on the market, but when the line is rewound it must be twisted

and twisted while winding it by hand. I made one that works with a small crank, and consequently the line no longer twists and snarls.

PINCH BARS

Another useful tool is the little claw or nail-pulling pinch bar. In different localities different forms are used; but after having tried several and having overcome prejudice against the appearance of some of them, I have finally

FIG. 28

decided in favor of the 24 or 26-inch square or octagon tool steel bar shown in Fig. 28. It is exceedingly useful in repair work and as a spike puller will save hammer handles.

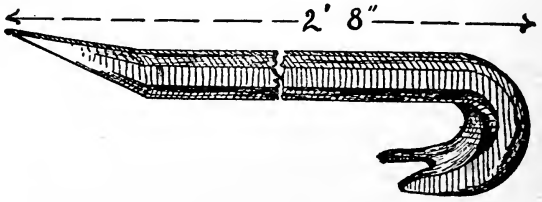


FIG. 29

Mr. Elmer E. List also contributes a sketch of his favorite pinch bar, which is a little different from the one described by Mr. Chase. It is shown in Fig. 29 and is made of ¾-inch octagon tool steel, with a chisel on one end

and claws on the other. It cost me 90 cents, and I would not do without it. The round claw end enables one to pull a heavy nail with ease and without the use of a block, while using the chisel end it makes a comfortable and powerful hand hold.

SCREWDRIVERS

A screwdriver should be neither too hard nor too soft. A good test is to file the steel; if it does not take hold it is too hard; if too soft, it can be filed easily.

A long screwdriver is easier to work with than a short one.

A writer in *The Blacksmith and Wheelwright* says that the young mechanic is very apt to ruin one or two good screwdrivers in trying to start set screws or screws that have rusted in. For this and similar work a specially heavy screwdriver is made, the shank being square and strong. The operator can then put all the power he wishes on the wrench, without fear of twisting it or bending the blade.

RENEWING SCREWDRIVER EDGE

When the point of a screwdriver is worn away, so that it jumps the nick in the screw, it is time that is was sharpened as evidently a section of your screwdriver is like Fig. 30, in which the sides of the wedge, in which all screwdrivers terminate, are curves with the convex sides out-

wards. When the screwdriver is in this condition, it will be apt to slip out of the nick of the screw. The best form is that shown in Fig. 31, where the sides of the wedge are curves with the concave side outwards. With this sort of a point the screwdriver may be easily kept in the nick without slipping. To grind a screwdriver into this form it is necessary to use a very small grindstone.

Another way to sharpen a screwdriver is by filing, holding it in a vise with the bevel of the point lying horizontal and projecting above the surface of the vise jaws; then use a medium flat file on it, giving a forward thrust only, and keeping a horizontal position throughout, directs

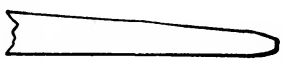


FIG. 30

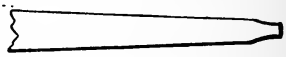


FIG. 31

the *British Optical Journal.* Turn the driver over and repeat the operation until the edge becomes very thin. Then file it down to a perfectly straight margin and regulate its width for the size required. This method is more satisfactory than truing up the point on a grindstone.

A SCREWDRIVER IMPROVEMENT

A writer in *The English Mechanic* remarking about screwdrivers slipping out of the nick describes a method to overcome this difficulty. All that is wanted is a short tube, big enough to enclose the screw-head somewhat tightly, but only spring-tight, so that it may rise as the screw-head

comes near the wood. Also, to provide for heads of different sizes with the same driver. All this can be done by just turning up a strongish tin tube, three or four inches long, like a slate-pencil case, big enough to slide over the widened point of a round screwdriver, and then fitting spring-tight on the shank by means of a piece of leather wrapped round it; and for larger screws than usual, you might pull the socket off and put a larger one on, with a thicker piece of leather. I find it answers perfectly. You need not even look at your screw, but just put the tubed screwdriver on and turn. It will drop into the nick at the first half-turn, and stay there till the screw is screwed home.

HORIZONTAL SCREWDRIVER

A writer in *Popular Mechanics* send a sketch, Fig. 32, of a horizontal screwdriver for use in a corner or other

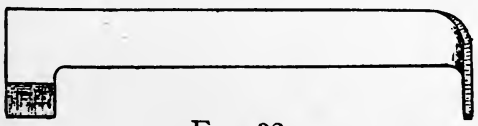


FIG. 32

awkward place. The one shown was made of sheet steel 1/8 inch thick, 5/8 inch wide, and length 4 inches, the width of screw-blade being 3/8 inch.

SELECTING A LIGNUM-VITAE MALLET

In selecting a lignum-vitæ mallet choose only the light-colored ones, recommends Mr. Emery H. Chase.

Those of light color are taken from the sapwood or

vital portion of the tree and have greater strength and elasticity than have those taken from the heartwood which is dark.

This is parallel to the fact that for the best wagons and buggies and hammer handles, etc., only young or second-growth hickory is used, thus giving greater toughness and durability.

The government tests prove the toughest part of a tree to be the sapwood portion just above the ground.

CHISELS

When buying chisels see that the handles are good and that the blades are set true in the handle, for if they are not, they will be likely to break under a sharp blow.

TO KEEP STEEL TOOLS IN THEIR HANDLES

A writer in *Machinery* says that to keep steel tools in their handles, fill the handle with powdered rosin and a little rotten stone. Heat the tang of the tool hot, and then push it down hard into the handle; when it is cold it will be firmly set.

TO MAKE A GLASS CUTTER

An old saw-file, with the end freshly broken, makes a very good glass cutter.

TO MAKE MARKS ON RULES SHOW PLAINLY

If you cannot plainly see the markings on the brass side of a caliper rule or slide rule, just rub a blue pencil over the whole slide and clean off, when it will be found that all the graduations are filled in with the blue pencil, and these dark markings can easily be seen

COUNTERBORING

Some time ago there was a kink published in *Popular Mechanics,* regarding counterboring, which I think worthy of being passed on to my fellow "Chips," who may not have had access to the paper above mentioned.

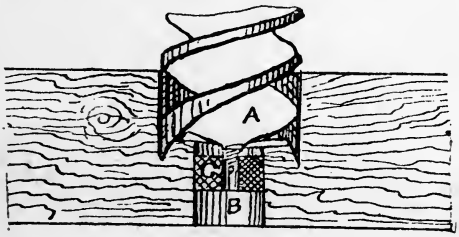


FIG. 33

Every carpenter has had occasion to counterbore holes, and in order to accomplish the job has, no doubt, found it necessary to first plug the hole in order to start the bit screw, which being deflected to a greater or less extent while boring, by the end grain of the plug, gave inaccurate and unsatisfactory results. A much quicker and more accurate method is to use, instead of the plug, a lead disk

C, which fits the hole *B*, to be counterbored and is screwed onto the bit point, revolving with it and holding it concentric with hole *B*. All of this is illustrated in Fig. 33.

These disks, being soft, are easily made, and a number of different sizes may be kept in the tool chest, and if the exact size needed is not on hand, a larger one may be quickly shaved down to suit.

A HANDY VISE

Mr. L. M. Hodge says that the vise illustrated in Figs. 34 and 35 is one of the handiest contrivances in its sphere that could well be imagined.

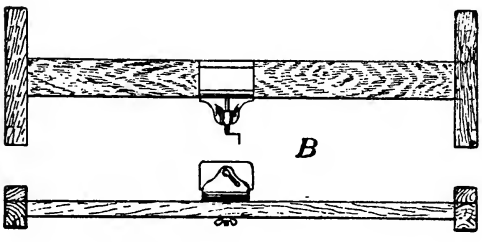


FIG. 34

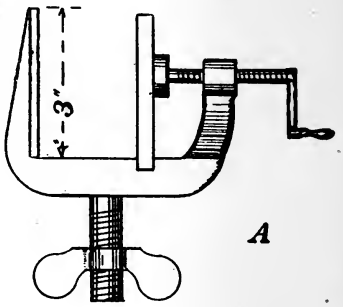


FIG. 35

As will be noticed, this device consists of a small vise or clamp mounted on a $\frac{3}{4} \times 3\frac{1}{2}$-inch stud, which is provided with a thumb-nut that enables one to readily fasten it to a saw bench or other object in almost any position, and to swing it about to suit the work that he wishes to hold.

This little tool is especially handy in finishing work, to

hold short pieces of base while being mitred, moldings while being coped, and various other work, such as holding a board while straightening the edge with a plane when a work bench is not at hand, etc., and when used in connection with the cross timbers shown at *B*, makes the most convenient and satisfactory device for holding doors while being fitted and hinged that I have ever seen employed for the purpose.

One cannot appreciate the convenience of this little tool or the great variety of work that it can be used for until he has owned one.

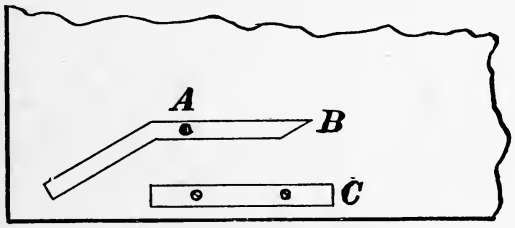


FIG. 36

If you cannot buy one already made, it is only a few minutes' work to make a pattern and have your foundry man to make one, which should not cost more than 75 cents complete.

A SIMPLE BENCH STOP

Mr. E. E. Bragg submits a description of a simple bench stop, which, he says, may be old to some carpenters; it is new to me, as I never saw or heard of anything

like it until I made one the other day and found it to be a success.

At the edge of the bench fasten a piece of wood 1 inch square, 6 inches long, by means of two screws.

Take a piece of 1 by 2, 12 inches long, and cut it like the form shown at *B*; fasten this down by means of one screw at *A*, but not down tight, so that it can slip backwards and forwards so as to clamp your boards, as shown in Fig. 36; *C* is a guide piece.

BENCH HOOK

As my contribution, says Mr. Jacob C. Miller, I submit to your readers a sketch in Figs. 37 and 38 of a very convenient tool for the top of a work bench. It is a bench hook or a tail stop for a bench.

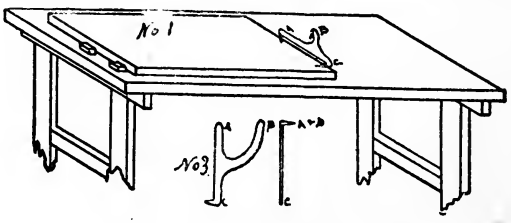


FIG. 37

The diagram No. 3 shows the bench hook; it is made of $^3/_{16}$ inch steel and about $\frac{5}{8}$ inch wide. From *A* to *C* it is 6 inches long, and from *A* to *B* it is 4 inches from centre to centre, with the points *A* and *B* at right angles to the upper face; the points are about $\frac{3}{4}$ inch in length.

Sketch No. 1 shows the hook holding the board flatwise

on the bench with the point *C* in the end of the board and the two points *A* and *B* slightly driven in the bench, thus holding the board in such a manner that a man may plane the board lengthwise or crosswise. It is also very convenient for holding a board on the bench while sawing for gains to be routed out.

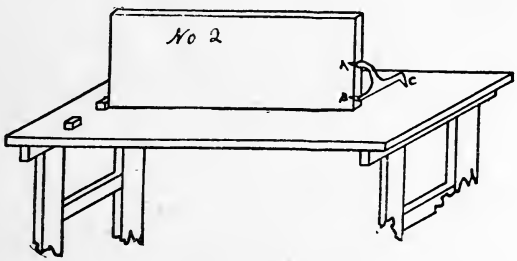


FIG. 38

Diagram No. 2 shows the hook holding a board on edge on the bench while planing the edge or while nailing a strip on the edge of the board. The two points *A* and *B* are driven in the end of the board, while the point C is driven in the bench, therefore securing the board from falling over.

Anyone wishing a handy tool of this sort can have a blacksmith make one; its cost will be a very small item.

A SIMPLE BUFFER

I have recently been interested in buffing shellac from hardwood floors and have tried nearly every kind of buffer available, but have found none with which I could do the work so easily and effectually as the one described below, says Mr. George W. Webster. It is one of my own im-

provements, and I describe it for the benefit of any fellow carpenter who may appreciate the same. It is cut from a 2 × 6-in. piece of plank and shaped like Fig. 39.

To hold buffer in place a pin is inserted in the hole *a*.

I use a buffer about 2½ inches square and cut a saw kerf into the heel of the block, so the buffer will extend below the block about ½ inch, so it will have plenty of room to clear off shellac and shavings.

I sharpen buffer with a file and give a short bevel; then sharpen on oil stone, taking a small gouge to turn the edge of buffer up, so it will cut readily.

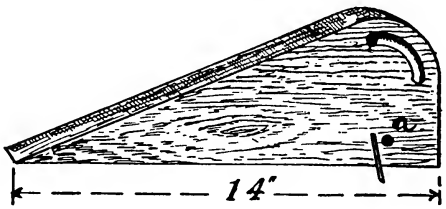


FIG. 39

Inserted as shown on diagram, I find an angle of ninety degrees about right to turn up edge of buffer.

With this instrument I can remove three coats of shellac from 300 square feet of floor in ten hours, down to the natural wood, which includes a thin shaving of the wood.

HOW TO MAKE A GLUE SCRAPER

Nearly every woodworker has a glue scraper, which is generally made from a strip of iron or a flat file, but

a better one can be made as shown in Fig. 40. The handle is made from a piece of hard wood $1\frac{3}{4} \times 1\frac{1}{2} \times 12$ inches. The blade is made of an old plane bit and is fastened to

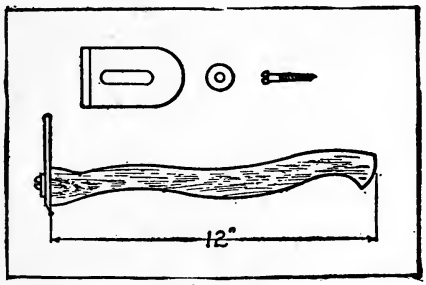


FIG. 40

the handle by means of a screw and washer, says R. B. Gregg, in *Popular Mechanics.*

USE FOR OLD HACK-SAW BLADES

A writer in *Machinery* says a useful scraper for wood is made as shown in Fig. 41. The handle is shaped, as shown, from steel or brass. The dowels hold the parts

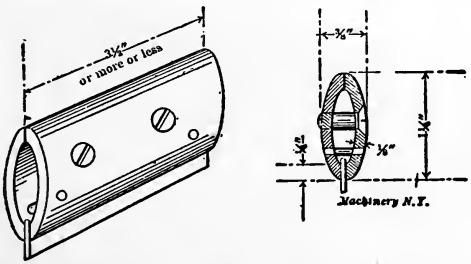


FIG. 41

of the handle in line and prevent the blades from slipping; they also locate the blades. The blade, being very thin, can be easily sharpened and kept sharp. It makes a most useful patternmakers' or joiners' scraper, and the blades cost

nothing to replace, broken or worn-out hack-saw blades being used for the purpose. A rough and ready handle can be made by sawing a narrow slit in the end of a piece of hard wood and driving in the blade tightly.

A SIMPLE SANDPAPER HOLDER

Mr. J. F. Spellman offers a very good suggestion for making a convenient sandpaper holder—an article which every woodworker has occasion to use practically every day in the year.

FIG. 42

I take a piece of ⅜-inch pine about 4½ × 6 inches, and on each end of this I glue a ½-inch strip, then cut a piece 4½ inches wide and long enough, so that it will fit snugly between the two ½-inch strips.

On the large piece of wood glue a piece of thick felt on the side opposite that to which the end strips are glued.

Place a piece of sandpaper around the part with the felt and fasten it in place by pressing the 4½ × 5-inch piece between the strips, and it is ready for use, as shown in Fig. 42. To make it easy to hold, round the edges of the top piece.

FOLDING SANDPAPER

The following method of folding a sheet of sandpaper, so that no two sanded surfaces will come together, will often prove a great convenience, and a whole sheet folded in this manner forms a pad for the sandpaper block. It is submitted by Mr. W. B. May.

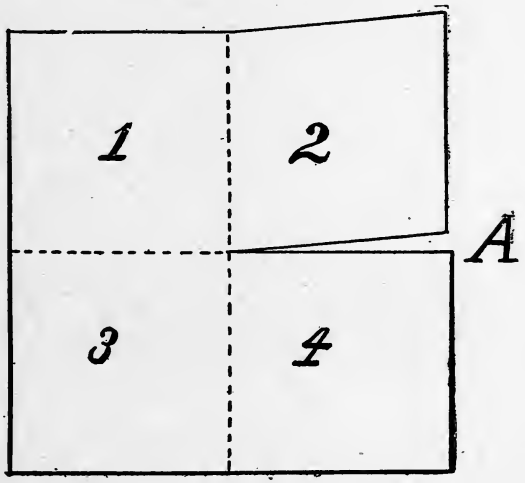


FIG. 43

The sheet is first cut half-way through in the middle, as at *A* in Fig. 43. The quarter-marked 2 is folded on 1 (the illustration showing the plain side of the sandpaper); then this is turned on 3 and finally on 4, forming a pad of four thicknesses, no two sanded surfaces coming in contact.

EASILY MADE TRAMMEL POINTS

A trammel point in which no fine adjustment is required, can be made from pipe fittings and a steel rod,

as shown in Fig. 44. The device can be made with either one traveling point, *A*, and one stationary point *B*, or with two traveling points, as may be desired. It was described by Mr. George A. Madison in *Popular Mechanics*.

In making the traveling point a two-light gas fixture body is drilled to receive the ⅜-inch rod, and tapped for

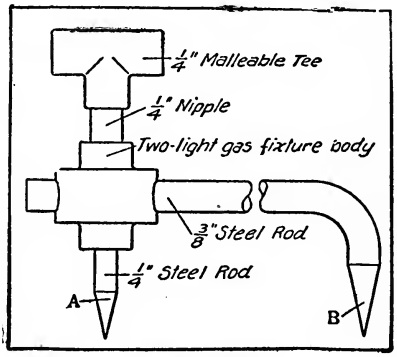


FIG. 44

the steel point, as shown. The ¼-inch nipple acts like a set-screw, and the ¼-inch malleable tee serves as a handle. The ⅜-inch steel rod can be made any length desired and can be bent either hot or cold.

TOOL BOXES

One of the interesting features of the *Practical Carpenter* was the variety of tool boxes described by various readers. In the following pages a few of these are given, lack of space prevents all of them being republished here, although all were interesting.

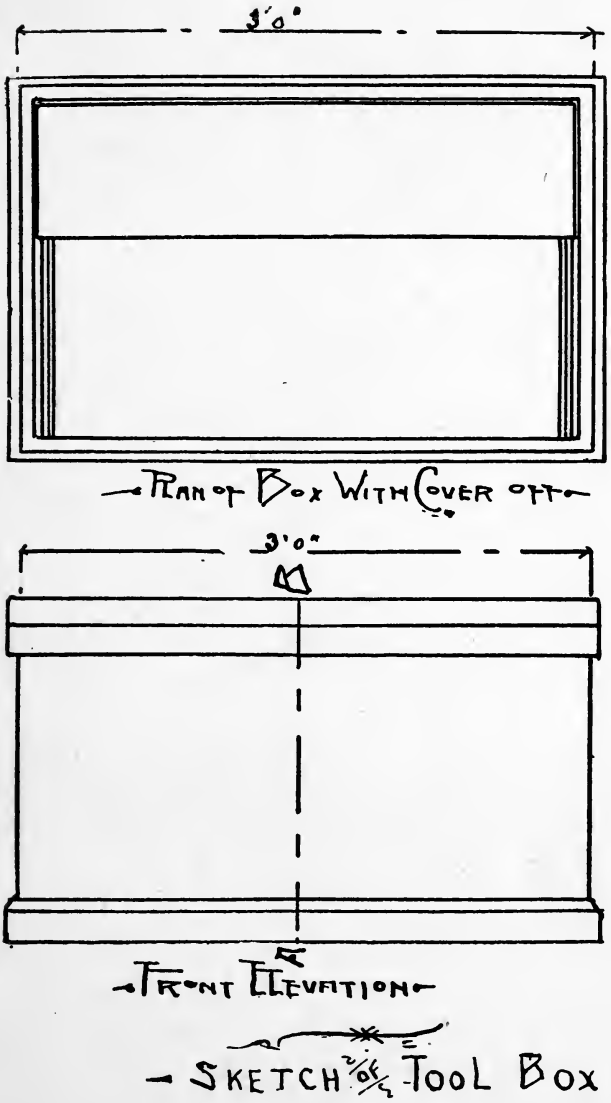

3'0"
Plan of Box With Cover off
3'0"
Front Elevation
Sketch of Tool Box.

FIG. 45

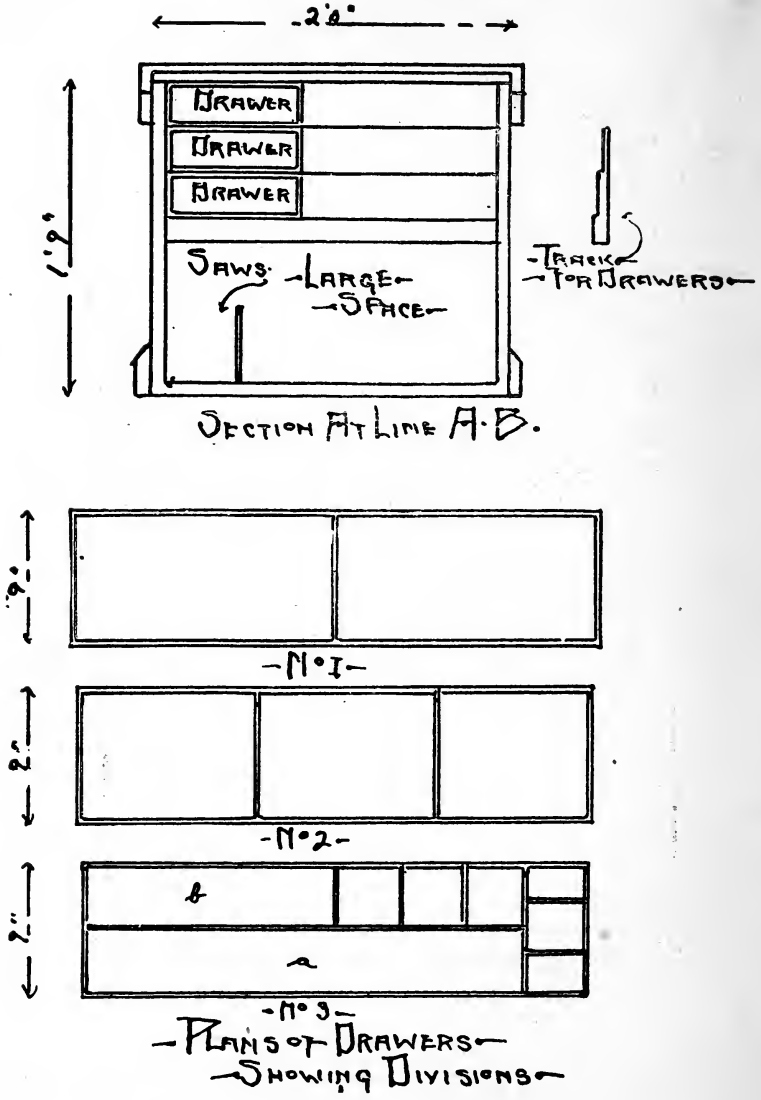

2'6"
1'9"
DRAWER
DRAWER
DRAWER
SAWS
LARGE
SPACE
TRACK
FOR DRAWERS
SECTION AT LINE A.B.
9"
2'
2"
No 1
No 2
b
a
No 3
PLANS OF DRAWERS
SHOWING DIVISIONS

FIG. 46

Figs. 45 and 46 illustrate the tool chest of Mr. John V. Bogert, who says that it is made of $\frac{7}{8}$-inch material, except the drawers, which are made of $\frac{3}{8}$-inch stuff. Cypress is used throughout, as this lumber can be bought in any width up to three feet, is clear and easily worked, and will stand the weather. The box is divided as follows: Three drawers to be used for small tools; a large space for large tools; and a small space for saws in the lower left-hand corner.

The drawers, unless made right, will "stick" when drawing them backward or forward. In order to overcome this difficulty they should be made about $\frac{1}{16}$ of an inch smaller than the space they occupy. All drawers should have covers hinged at the back to keep out dirt.

I would like to call attention to the divisions in the third drawer. The space *A* is used for the level, the space *B* is used for miscellaneous articles, and the smaller divisions are used for screws, small nails and a great many other small things.

All cross partitions should be mortised into the sides, and they should be screwed together, as nails will work loose. All other joints should be miter joints and well nailed.

After all this has been completed, the top should be covered with either zinc or galvanized iron, which makes the box waterproof. The handles should be placed about one-third of the distance down from the top.

Fig. 47 shows the design of Mr. George W. Webster, and he has the following to say about it: I find it very much handier than any I ever used. It is on the plan of a bureau; there is no cover to lift, but drawers to pull out.

I keep saws and planes in the bottom drawer; hammers, bits and brace, shop axe, files, floor-set, etc., in the 7-inch drawer; boxes containing brads, screws and special kinds of nails in the 5-inch drawer; chisels and small tools in the 3-inch drawers.

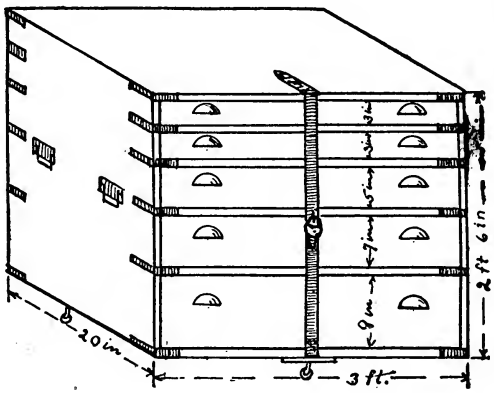


Fig. 47

The chest weighs 300 pounds when the tools are all in it; but the way the castors are put on, one man can easily move it anywhere the castors will roll. The two castors in the middle being ½ inch lower than the two end ones, make it easy to guide the chest anywhere, and also to swivel or turn it around.

The convenience over any other chest is a place for everything, and everything in its place. When transported

on cars, they never stand it on end or tumble it about. My experience with the kind you have published is that at the end of a journey the tools are found all mixed up and the chest more or less damaged.

The strap of iron shown in the middle of the front is to keep the drawers in place when chest is being moved. It is 1½ inches wide and drops over a staple in which a padlock is placed. It is in two parts, meeting or lapping over each other at the staple; at top and bottom it is attached to strap hinges.

My chest is made of pine, stained cherry. Drawers dove-tailed and work easily on ways.

Quite a novel design for a tool chest is submitted by Mr. Lauritz Smith. Fig. 48 is self-explanatory. Plans of shelves, trays, etc., may be changed to suit. He thinks that this is the best plan for a tool chest that he has ever seen. Every tool has a certain place, and one can find any tool desired without trouble—in the dark, if necessary. If trays, etc., are proportioned right, there will not be an inch of waste space in the chest. Almost any tool chest may be converted to this plan with little work. Partitions are all made from ½-inch pine.

By way of variety we show in Fig. 49 a tool chest made for sale by a dealer in tools. It will no doubt give suggestions on how a box can be conveniently arranged.

In connection with the different designs of tool chests, Mr. Emery H. Chase gives the following hint: Let the

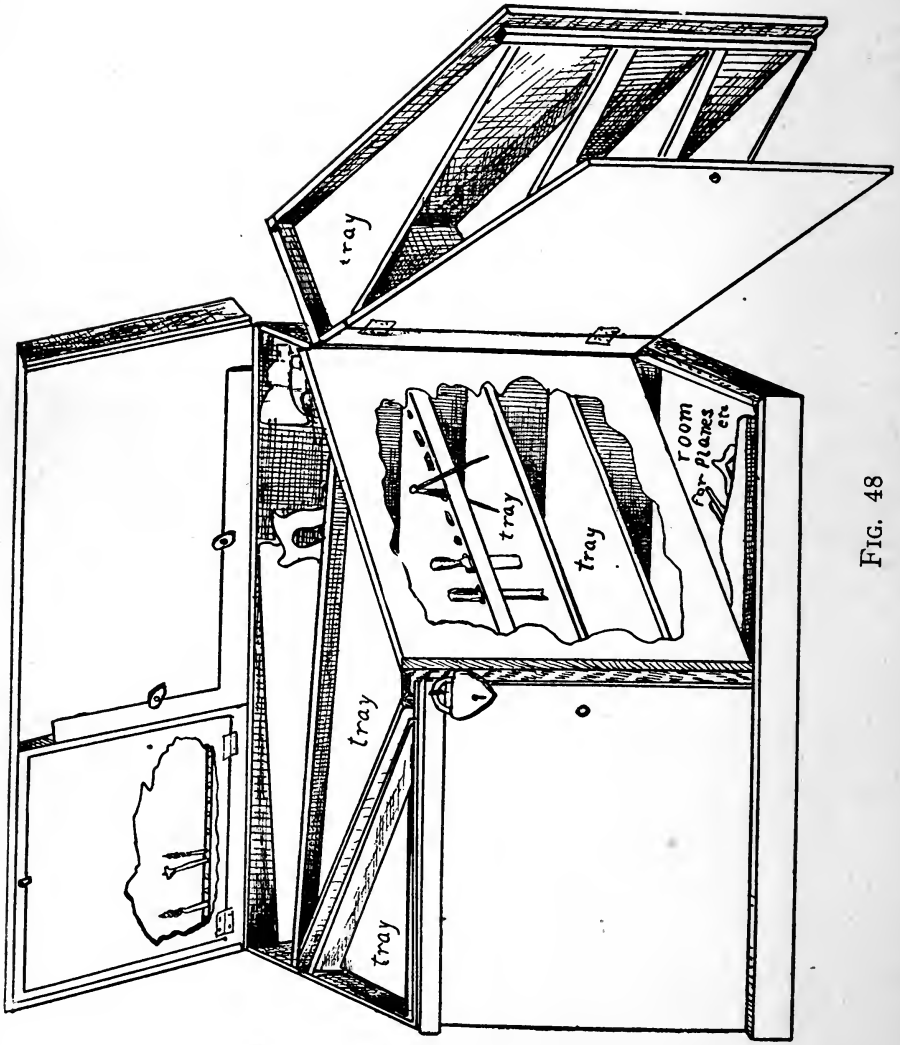


FIG. 48

carpenters try wheels on their chests, like those on safes. I have four 6-inch iron wheels under my chest, and they are "just the thing" needed.

You can wheel your chest over a sidewalk for any short distance quite easily and better than to wait for a drayman.

And the wheels are useful every time the chest is moved. Try it!

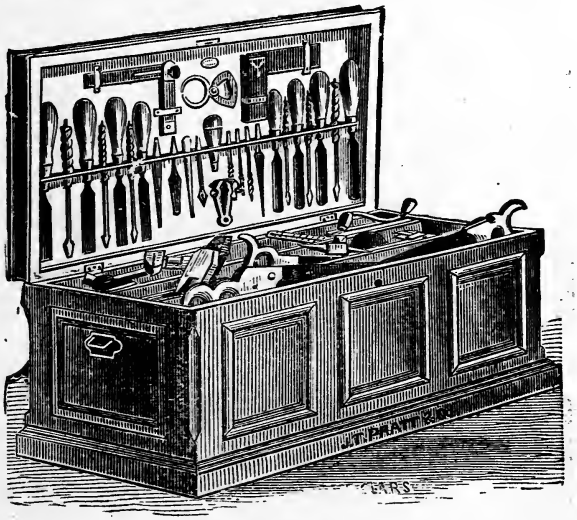


FIG. 49

So much for tool chests; but the carpenter sometimes wishes a light box that can be easily carried about. Something along the line of a dress-suit case is shown in Fig. 50, which was submitted by Mr. Mansfield Bolls.

The tools are held in place by common galvanized iron, cut in strips 1 inch wide, and long enough to screw to inside of box and crook up to form a kind of spring hook. The

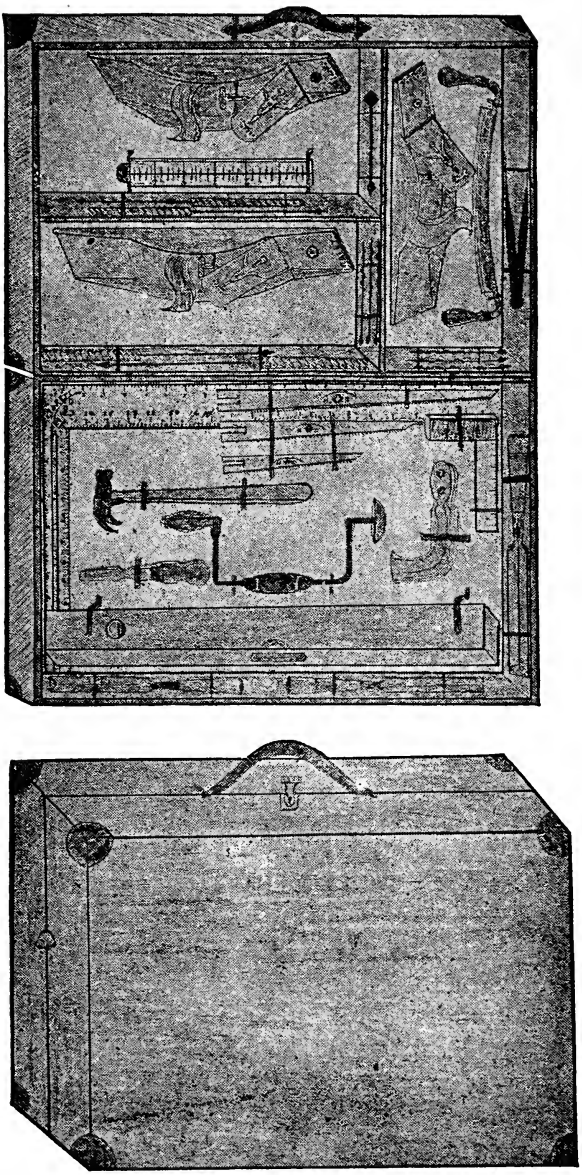


FIG. 50

box is, when closed, 6 inches wide, 16 inches deep and 24 inches long (inside measure). The square is the last tool to be put in, so it is always on top and ready for use. The three planes fit in a box made separately for each. The level is held by two strips of iron, one of which is fastened by only one screw, so it can be turned down to let the level go in and out. By being held in these fastenings, which form a spring, the tools are held firmly in place, so they will not "rattle" in carrying. The box is made in two parts of equal size, and hinged together, forming a kind of "grip" or case. At each end, in addition to the handle

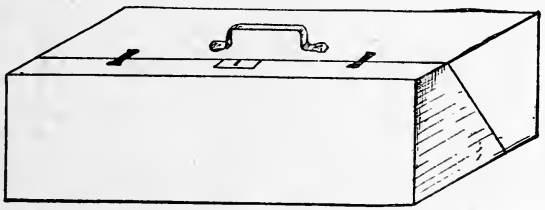


FIG. 51

which is on top, rings may be attached to fasten a strap to go over the shoulder.

Fig. 51 shows the design of Mr. F. C. Zook. The beauty of which is that when open it lies flat down, so there is no need to disturb any of the tools but the one wanted.

My chest is made of ½-inch cedar; it is strong enough for all ordinary purposes. The interior can be finished with drawers and partitions to suit the ideas of the user.

The ends are 8×13 inches, cut as shown; the two

divisions are held together at the bottom by three brass hinges, the top by two clasps and lock. A handle on top makes it convenient to carry.

If it is made 32 inches long inside, it will hold any 28-inch rip-saw. If a 28-inch saw is used, it can be placed in the lid or leaf. Three saws can be placed in the lid by having the blade end of one saw placed between the handles of the other two.

When finished in cherry stain and varnished, this box looks neat.

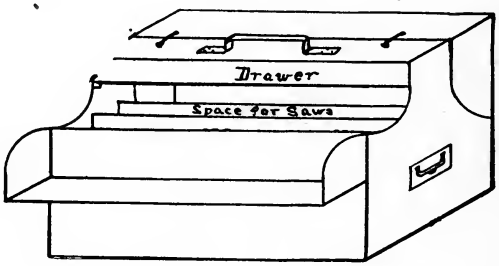


FIG. 52

Another shoulder box that folds down is shown in Fig. 52, which is submitted by Mr. Luther Moseley.

It is made of ½-inch stuff, except the ends, which are ¾ inch thick. The box is 12 inches high and 8 inches wide. The ends are cut in three pieces each. On the middle of the top is a piece of wood fixed to the ends to which a handle is fastened. The sketch plainly shows how the box is arranged. One side comes down a little lower than the other. The idea is to not expose the teeth of the saws; hence the side in which the saws are placed is not

cut as low as the other. This space for the saws is 2 inches wide, so I can place two saws with handles together and one with the handle at the other end and with the blade between the other two handles.

In the main part of the box place planes and such tools as are needed. In the drawer or till place chisels, bits, line, chalk, level, etc.

The handle bar is 2 inches wide and rabbeted on both sides, so as to receive the sides when closed; this makes the strain on all the top the same.

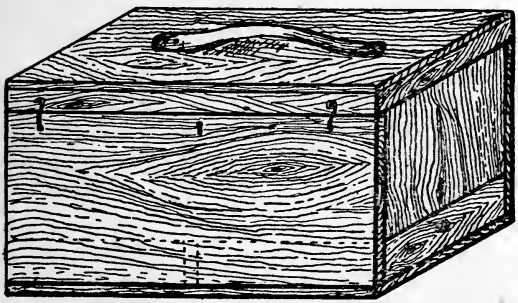


FIG. 53

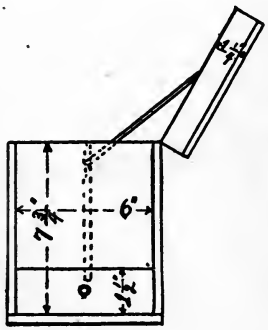


FIG. 54

A leather handle on the bar costs 25 cents; clasps to fasten the sides, eight brass corner pieces, hinges and screws cost about one dollar. When I stained it with red stain, I had a shoulder box I am not ashamed to take in any crowd of workmen.

The till is placed in the box on cleats, fastened at each end with small screws, and when the tools are properly placed in my box I can stand it on end without having the tools fall about.

A handy little box which can be easily carried is shown in Figs. 53 and 54. It was made by Mr. F. A. Williams and is only 19½ inches long. One drawer in each end for two sizes of bits. The lid cheek, with ⅛-inch rod connected, locks the two drawers; then turn the key and the box is all locked. The bottom is ¼-inch ash, and the balance is $^{5}/_{16}$-inch cypress, glued and well nailed. Stain or finish in natural wood, with five sets of brass hinges. Handle of leather, 1½ inches wide, bolted to lid. This will hold all of the tools, except the saws and steel square.

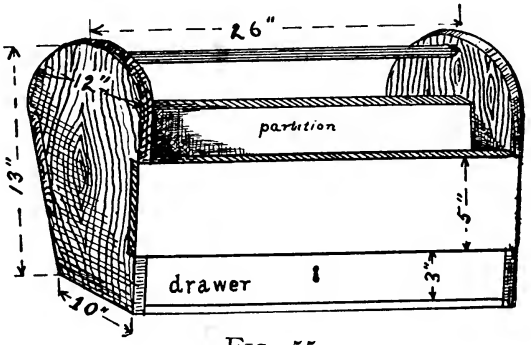


FIG. 55

Something out of the ordinary is a good, light hand tray for carrying a kit to do odd jobs. Fig. 55 shows a design submitted by Mr. L. Smith. The principal dimensions are given on the figure, and a good length is about an inch longer than the longest saw you intend to carry. The height of end pieces may be about 13 inches if made with drawer in bottom, which will be found a great convenience to carry small tools. A shoulder strap will be found a great help, if one has to carry the kit any distance.

Of course the dimensions will be governed by the amount of tools carried, and their size, but Fig. 55 shows the dimensions of a handy size.

SOMETHING ABOUT NAILS

The following hints are submitted by Prof. John Phin:

Every one is familiar with the fact that a piece of rusty iron, wrapped in cotton or linen cloth, soon destroys the texture of the fabric. A rusting nail, for example, if laid upon a few rags, will soon produce large holes in them; or it will, at least, render every point that it touches so rotten that the cloth will readily fall to pieces at these points, and holes will be produced by the slightest hard usage. From this well-known fact we may draw the conclusion that iron, during the process of rusting, tends to destroy any vegetable fiber with which it may be in contact. This explains, to a certain extent, the rapid destruction of the wood that surrounds the nails used in outdoor work, whereby the nail is soon left in a hole much larger than itself, and all power of adhesion is lost. Part of this effect is, no doubt, due to the action of water and air, which creep along the surface of the nail by capillary attraction, and tend to produce rottenness in the wood, as well as oxidation in the iron. But when we compare an old nail-hole with a similar hole that has been exposed during an equal time, but filled with a wooden pin instead of an iron nail, we find that the wood surrounding the wooden pin

has suffered least; and we may, therefore, fairly attribute a destructive action to the rusting of the iron. It might, at first sight, be supposed that, as the oxide of iron is more bulky than the pure iron, the hole would be filled more tightly and the nail held more firmly to its place. But, although this effect is produced in the first instance, yet the destruction of the woody fiber and the pulverization of the oxide soon overbalance it, and the nail becomes loose. Of course, the iron itself being also destroyed, its strength is diminished; and we have, therefore, a double incentive for preventing or diminishing the action that we have described. The only way to prevent this action is to cover the nail with some substance that will prevent oxidation. This might be done by tinning, as is common with carpet-tacks, which are now extensively tinned for the purpose of preventing them from rusting, and thus rotting holes in the carpets. Coating them with oil or tallow would be efficient, if the act of driving did not remove the protecting matter entirely from a large portion of the surface. But, even then, it will be found that the oil or fat is stripped off the point and gathered about the head in such a way as to prevent the entrance of air and moisture into the hole.

The most efficient way to coat nails with grease is to heat them to a point sufficient to cause the grease to smoke, and then pour the grease over them, stirring them about in a pot or other vessel. When the nails are hot, the melted

grease will attach itself to them more firmly than it would have done if they were cold; indeed, so firmly that it will require actual abrasion of the metal to separate it. In erecting fences, laying plank or board sidewalks and the like, it becomes an important matter to secure the nails against the influence that we have mentioned, and yet the work must be done rapidly and cheaply. Nails may be readily prepared as described, or they may simply be dipped in oil or paint at the moment when they are driven in. And we have found, by experience, that in cases where it is not advisable to paint the whole fence, it is, nevertheless, a good plan to go over the work and touch the head of every nail with a brush dipped in oil or paint prepared so as to be of the same color as old wood.

Nails may be more easily driven into hardwood by first touching the small end in grease.

To draw a rusty nail that sticks tight, first hit it a blow with a hammer sufficiently hard to start it in a little, which breaks the rusted connection; the nail then can be easily drawn out.

SOMETHING ABOUT SCREWS

There are poor as well as good screws. A good screw should have sound and well-cut heads, no breaks or flaws in the thread part, and good gimlet points. If they are warmed and dipped in raw linseed oil or tallow, it will prevent their rusting, hence they can be unscrewed easily.

When the work in which they are used is exposed to much wetting and drying, screws are of little use. They soon rust, rot the wood around them, and draw out, looking like screws without threads. Dipping them in thick paint or tallow before driving them helps to protect them. When used in inside work and in soft wood, they may be dipped in glue. This makes them hold well, and when thus treated they are more easily driven. But the best plan is to heat them with oil or tallow in a pan. The grease then adheres more strongly, and the protection is more complete.

It is a common thing, when a screw or staple becomes loose, to draw it out, plug up the hole or holes with wood, and then reinsert it. But screws and staples so secured soon come out again. It has been found that a much better way is to fill up the holes tightly with cork. Screws and iron so secured will remain perfectly tight just as long as when put into new wood.

HOW TO LOOSEN SCREWS

Few things are more vexatious than obstinate screws, which refuse to move, much less to be drawn out, and in the struggle against the screwdriver power suffer the loss of their heads, like conscientious martyrs, rather than take a single half-turn backwards from the course they have followed, and from the position they have been forced into. Like obstinate children, they must be coaxed or rapped pretty hard on the head, according to circumstances;

in fact, whoever has a tight, obstinate screw to "draw out" must keep his temper down and his resolution up, quite as much to the sticking point as the screw does. If the screw is turned into iron and not very rusty, it is only necessary to clear the head with the wedge of the driver, and let a few drops of oil penetrate to the threads; but, finding that excessive heat or rust has almost fixed the screw immutably, then heat, either by placing a piece of hot iron upon it or directing the flame of the blow-pipe upon the head, and, after applying a little oil, turn out gently; but care must be taken not to let the tool slip so as to damage the notch. If, however, the screw refuses to come out, try to force it back with a blunt chisel, smartly but carefully tapped with a light hammer; but if evidently nothing can dislodge the enemy, it is best to cut the head away and drill out the screw. When an obstinate screw happens to be in wood, merely give it a few taps on the head; but, failing that, heat it with a piece of hot iron, heat is applied to its head, which may be readily done with a red-hot kitchen poker, when it may be easily turned.

A SCREW AND NAIL BOX

One of the most inconvenient things for a carpenter is the hunting for the different sizes of screws and nails. Instead of looking through various bags or other receptacles for the size or sizes required, why not make a box for the screws, also one for the nails, and offset this trouble.

To make a strong box for screws or nails is a very simple and quick matter once you get at it. A box $15 \times 2 \times 9$ (inside measurement) will be found adequate for most wants. The ends can be joined together accord-

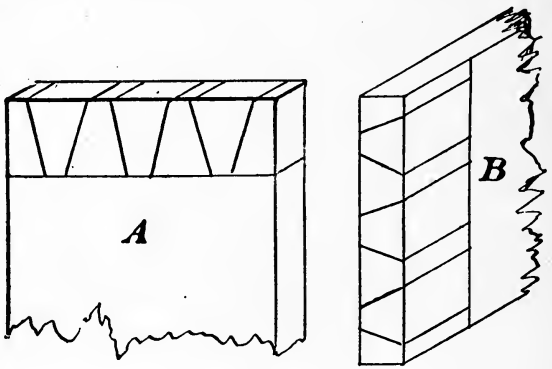


FIG. 56

ing to taste, but dovetail joints for this purpose will answer to best advantage, because a joint of this class cannot be easily pulled apart. Fig. 56 shows a method of laying out a joint of this kind. Three dovetails are all that are required

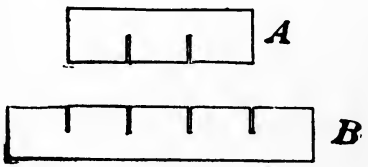


FIG. 57

for the height of the box. (*A* represents the end, *B* the side.)

After the sides of the box are dovetailed together, the bottom is then ready to be put on. This part of the box should be screwed on, as nails become loose too quickly.

The box is now ready for the divisions to be put in. Thin stuff is all that is required, and this should be notched together as shown in Fig. 57. (*A* represents the width for the division, *B* the length.)

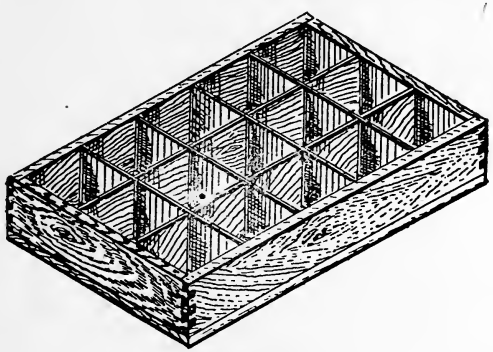


FIG. 58

The box when completed, if the above instructions are complied with, will contain fifteen divisions, about 3×3 inches, which allows for as many different kinds of nails or screws.

Fig. 58 shows the box when completed.

REPAIRING A GLUE POT

A few winters ago my glue pot was cracked with frost by having water left in it over night. I repaired it by taking some iron filings. By using a horseshoe magnet only the clean filings without dirt were obtained. After scraping the rust off along the crack I spread the filings on, then moistened it with a few spoonfuls of sal ammoniac solution from an electric battery. After drying a few days the filings were rusted together and the pot fit for

use. It is still in use, but in winter no water is left in it over night.

HOW TO MAKE AN ELECTRIC GLUE HEATER

In the shop where electricity is used the electric glue heater is the simplest device of its kind. The illustration,

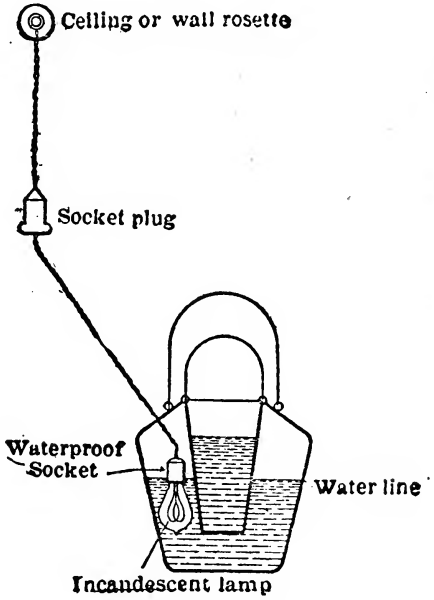


FIG. 59

Fig. 59, shows how it is arranged. An incandescent lamp with a waterproof socket is suspended in the water in the kettle, and the joints between the glue pot and the kettle are made perfectly tight. A 32-candlepower lamp will boil the water in from two to four minutes, says a correspondent of *Woodcraft,* while six or eight candlepower will keep the kettle warm.

REPAIRING OLD GLUE-JOINTS

Sometimes two pieces of wood which have been joined together by glue separate at the joint. Before gluing them together again, the old glue should be carefully washed off with warm water and the surfaces allowed to dry. Then proceed as if making a new joint.

TO PREVENT GLUE CRACKING

Glue frequently cracks because the dryness of the air in the rooms warmed by stoves. The addition of a little chloride of calcium to glue will prevent this disagreeable property of cracking. Chloride of calcium is such an absorbing salt that it attracts enough moisture to prevent the glue from cracking.

REPAIRING A BROKEN POLE

The following may be of interest to a number of readers. I was called upon to repair a broken flag-pole, and it was necessary to repair it as soon as possible, as a flag-raising was to take place. As there was no time to get iron straps, I hit upon the following scheme:

Fig. 60 shows the break. Two saw-cuts were then made on each side of the pole, and the strips shown by the dotted lines were removed. One of the saw-cuts was made about a foot from the break, and the other at a distance of two feet.

These strips were then turned around and nailed on to the middle portion of the pole, as shown in Fig. 61, which explains clearly how the repair was made. The pole was then ready to be used. Very likely this would be strong

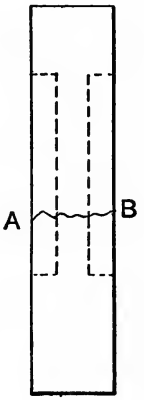


FIG. 60

FIG. 61

enough, but in a few days I had iron rings made and placed around the joint as a matter of precaution.

SPLICING TIMBERS

Somewhat similar to the previous problem is the method of splicing heavy timbers, which is submitted by Mr. D. J. Dodrill.

Suppose it is required to have a 24-foot piece of timber and the only available pieces are 12 feet long. The method of doing this is shown in Fig. 62.

Let *A* be 12 feet long and *A*1 be 12 feet long; these are to be 24 feet long after being spliced.

Cut a piece out of *A* as shown in sketch, any length and width desired, and from *A*1 the same width, only twice as long as *a;* put *a*1 twice as long as *a* on *A* and the piece *a* out of *A* on *A*1. Get two pieces of strap iron and finish as sketched.

B represents bolts, *C* where the two 12-foot pieces come together.

The sketch is plain enough without further explanation. It does away with a clumsy splice as is generally in use.

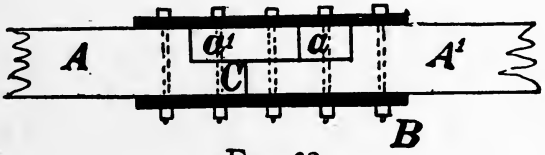


FIG. 62

This idea was given to me by an old ship carpenter as the way a broken mast on a ship was repaired. Trusting that it might be of value to your readers I send same.

DOVETAILING TRICK

Something of no practical importance, but very interesting is the dovetail joint between two square blocks of wood (Fig. 63). The dovetail shows on the four sides and will puzzle most mechanics to know how it is made.

It however is quite simple, as will be noticed from Fig. 64, which shows how the dovetails are cut.

A good way is to have one piece stained and the other natural, so that the dovetails will show very plainly.

As a test of patience and skill in joinery this a very fine example.

SCAFFOLD BRACKETS

Particular pains should be taken with scaffolding. Don't use planks with many knots in them for scaffold boards. Use good solid pieces and see that the brackets that they are placed on are well made. Don't be stingy with

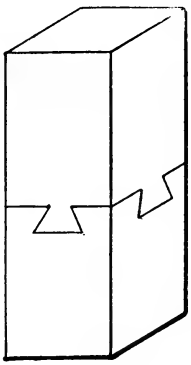


FIG. 63

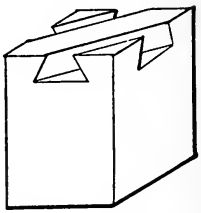


FIG. 64

nails—it's risky work. Next have sufficient width of boards, so a man can stand on them without doing any tight rope balancing.

Fig. 65 shows a bracket nailed to the studding; it is a good design, but must be well nailed. It was submitted by Mr. Fred. Black. To remove it, simply saw it off even with the sheathing.

A design for a portable bracket is submitted by Mr. Philip H. Miller and is illustrated in Fig. 66; it does not

take as long to put up and when taking it down, all you have to do is to unhook it.

It is made in five pieces counting the hook.

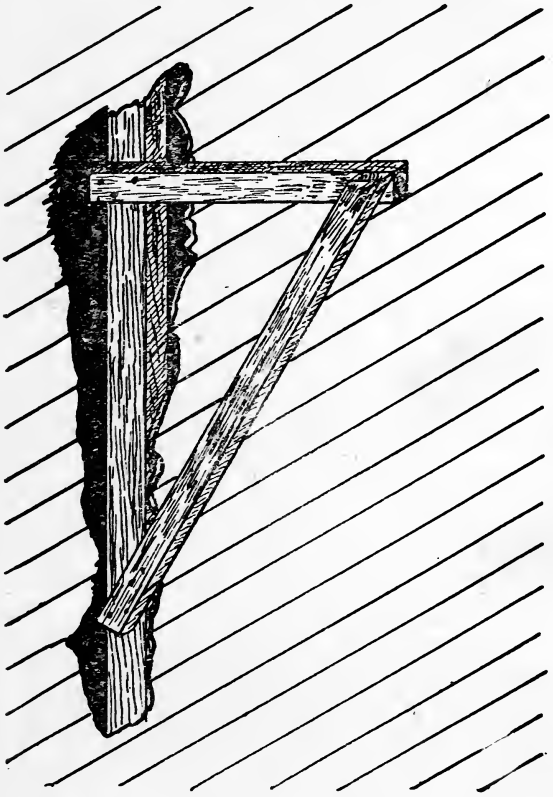


FIG. 65

We bore inch holes in the sheathing close to the studs and put up our bracket. I send you herewith a sketch of them.

The hook is made of malleable iron; it has a slight bevel. The $\frac{7}{8} \times 3$-inch pieces are bolted on the 2×3-inch pieces.

With these brackets we go any height siding from the top down.

Another form of portable bracket was recently described by a writer in *The Master Painter.* This is shown in Fig. 67.

The device here shown is a form of scaffold bracket used in the country by plasterers and carpenters when

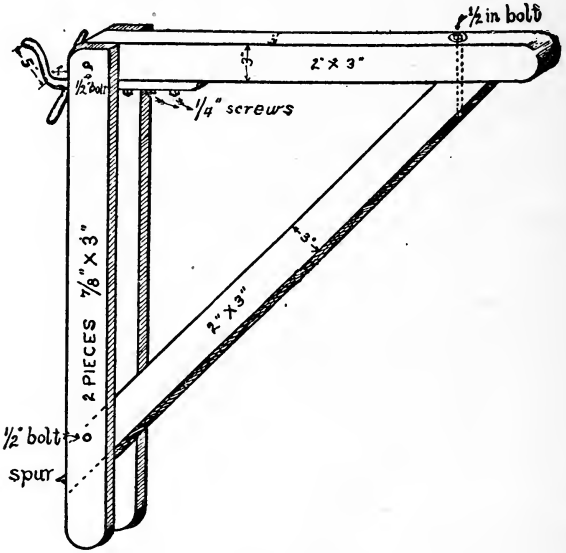


FIG. 66

obliged to do some work at some high and not easily reached part of a building, where the job is of such a character that an elaborate scaffolding is out of the question, its smallness not justifying the expense. The figure *A* represents pieces of 3×4; the figure *B* indicates pieces of common inch board. *C* shows a pole, of such length as may be necessary to elevate the scaffold to the desired

point. The pole, usually a tall, slender tree that has been divested of its branches, is inserted in the angle of the bracket, as shown in the cut, and is then pushed upward, until the bracket is in the position sought, or where the workman wants to stand at work. The foot of the pole, if at some distance from the base of the building, may be

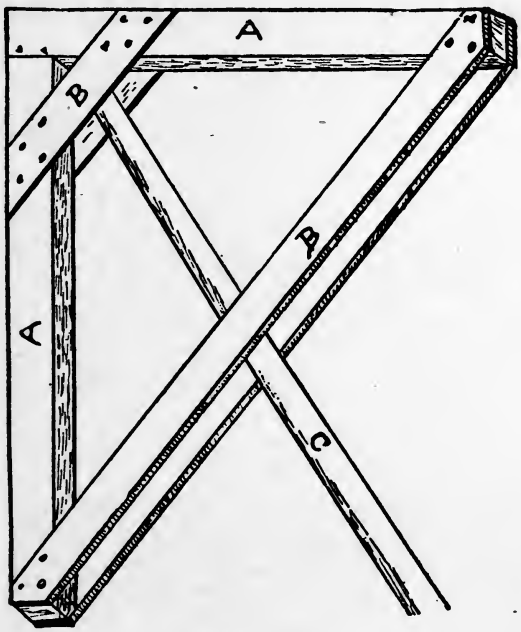


FIG. 67

secured from slipping by driving a stake there. Two or three poles, with a board or more across, can be raised simultaneously in a few minutes, and there you have a strong and perfectly safe scaffold to reach the loftiest gable end of barn or house, where there is only a barge board to do, as a rule. It can be done quite quickly. The figure here

shown we drew from a set of brackets that were used on a job where we once worked. We would recommend that two of them be made when work is slack, so that they will be ready when the time comes to use them.

PORTABLE HORSES

Saw horses are very awkward to stow away, and it is a convenience to have portable ones that can be easily

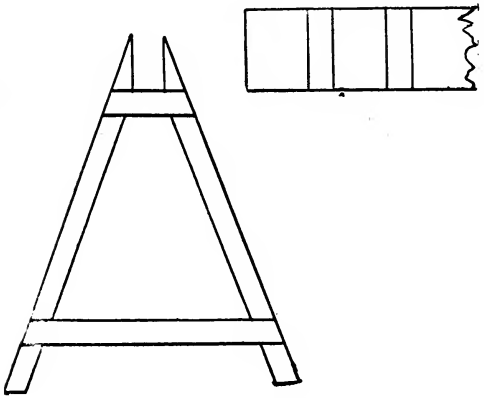


FIG. 68

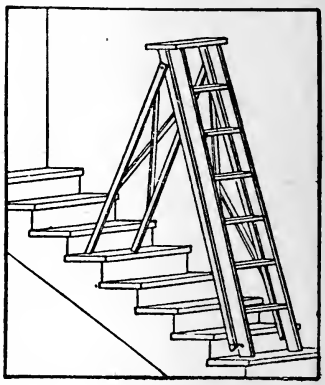


FIG. 69

moved from one job to another. Fig. 68 shows its construction.

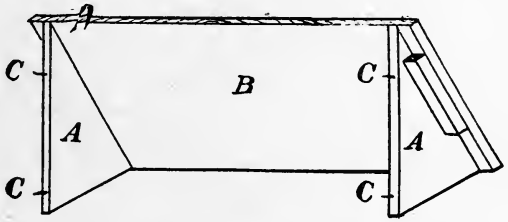
STEP-LADDER FOR STAIRS

An ordinary step-ladder cannot be used on stairways, but by adding the attachment as shown in Fig. 69 it can be used in that position with perfect safety. Fasten on an extra pair of legs somewhat shorter than the original legs and arrange so that either pair may be used when

wanted. Hooks and eyes may be used on the long legs to hold them against the ladder when using on a stairway, thus making the device easier to move up and down stairs. This device was submitted by Mr. John Weldon to *Popular Mechanics.*

PORTABLE BRACKET

Mr. P. Van Valkenburg submits a very handy device. It is shown in Fig. 70. For getting around on shingle



A A—Bottom and end pieces.
B—Seat.
C C—Brads.

FIG. 70

roofs, patching, fixing chimneys, etc., it is a "short cut," simple, inexpensive and ever ready, saving much time in finding and making ready other brackets. It can be made any size to suit the user.

Mine was made from a piece of board 9 × 12 inches by 1¼ inch thick for the bottom pieces after being ripped from corner to corner, and a board 12 × 20 inches and 1 inch thick for the seat, which is all the material required, except two little blocks in the corners under the seat, a

few nails to put it together, and four brads, which are also made of wire nails. The drawing explains itself.

Something different than the portable seat or bracket is the roof hook shown in Fig. 71, which was submitted by Mr. E. E. Bragg.

It is very handy in shingling a roof and is easily made. Take a rod of iron ½ inch square, or an old hack tire. I believe the hack tire makes the best one, for it is flat and will lay down on the roof and is not in the way of the chalk line.

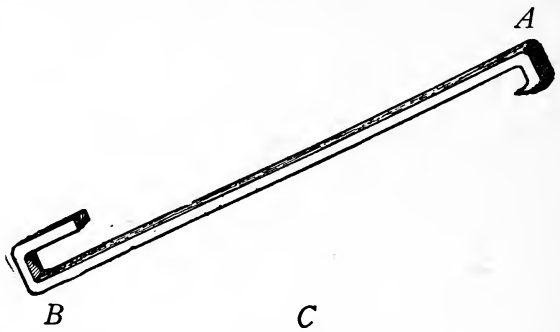


FIG. 71

At the part *C* make it 5½ feet long; at *A* turn a hook 1¼ inch each way and make the point sharp, so you can hook it over the comb when you get to the top; at *B* turn down 2¼ inches and up 6 inches, so you can drop a 2 × 4-inch timber in it for a scaffold.

To use just hook the end *A* in the shingle lath.

SHINGLE HOLDER

Fig. 72 shows a shingle holder described by Mr. Harry

Kelsey in *American Carpenter and Builder*. It is for shingling where the roof is sheathed tight, and especially at the top in putting on the last rows of shingles. The object is to hold the loose shingles in convenient form for the workmen. The hooks are sharp and can be set anywhere on the roof or hooked over the comb. If you think it worth while to illustrate the drawing, I am sure it will be appreciated by many of the readers. It is made out of ⅜-inch steel

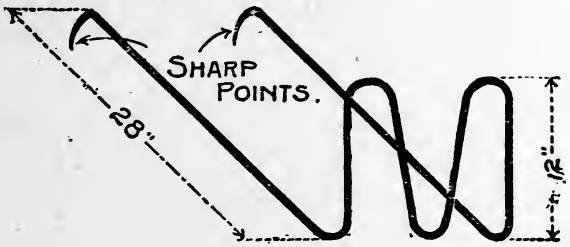


FIG. 72

pump rod, and any blacksmith can make them. A half dozen of these holders will be plenty for most any one.

HANGING AND LOCKING DOORS

A rule that is followed by quite a number of carpenters was given by Mr. W. F. Petch, and this is to place top hinge 7 inches from top of door, and bottom hinge 10 inches from bottom of door. If three hinges are used, place the middle hinge midway between the two, which places it nearer the top and relieves the strain on the bottom hinge. I place center of door-knob 2 feet 10 inches from floor; but as a general thing each man has a rule of his own.

FITTING DOORS

The following hints on this important subject are from the pen of Mr. J. C. Browne:

What the joiner requires is system, accuracy and speed.

Starting out with these three ideas as a motto, or text, he will ask what is the first thing required? This will be a straight edge, which should be made of the lightest dry pine, say 6 feet long by 4 inches wide and 1⅛ inch thick.

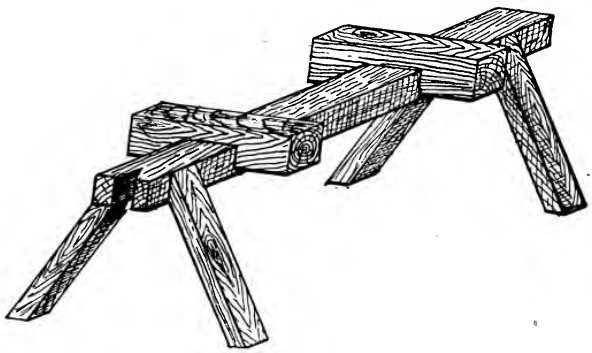


FIG. 73

FIG. 74

Every carpenter is supposed to own a level—plumb and true. Most levels have a screw at each end: back out the screws and insert a brass eye with wood thread to fill tightly the screw hole. Set the level on the straight edge and drop long screws through the screw eyes into the wood of the straight edge, and you will have a very handy implement to help along your work.

In setting the jambs the head should be dadoed into the sides. The sides should be cut neatly off half an inch

longer than the height of doors and a mark made on their edge, say 12 inches from the bottom. When nailed together on the bench, nail a straight-edged piece of lath, marked from the width of door at head, at the 12-inch marks, to hold the jambs together when setting up as a door frame.

Test the rough door opening with your plumb board; if that is correct set up your frame to either rough jamb. Try your level on the strip nailed on the 12-inch mark, rack the jamb that is low to a level and scribe the other to match it and so bring the door head to a level.

Cut a piece of board the length of the head to set on the floor between the jambs so that they can be racked to a square and proper width. Then proceed to rack the first jamb plumb and straight by your instrument, also plumb the other jamb, so that it will be out of wind like its mate. All this performance can be gone through by the expert quicker than it takes to describe it.

When there are a number of doors to fit and hang, a handy thing to have is a saw bench, made from a piece of dry clean scantling, 3×4 inches and about 5 feet long. The legs $1\frac{1}{4} \times 5$ inches and 2 feet long and well spread at the bottom. Take two pieces of scantling 2×4 inches by say 2 feet long and notch them out on center $2\frac{1}{2}$ inches deep to fit neatly across the upper side of your bench (which should be 4 inches wide) and down over its edges and sides. These pieces should be movable or adjustable

and should not be nailed to the bench, only key-wedged if necessary; they can in that way be shifted to fit short doors, sash, etc., when required.

On one end of the bench rip out a wedge-shape notch or bird mouth to hold the door on edge while being dressed and jointed off. Fig. 73 shows the completed bench.

When starting to fit the door, if it is double-moulded, sight the stiles; if not perfectly straight on sides turn rounding sides to back, and if in wind, have it so that the lock edge of the door strikes the door stop at head first if possible.

These preliminaries require but a moment's time and save a whole lot of trouble afterward.

Lay the door on the cross bars of the bench and take a couple of dressed pieces of lath that will slide nicely together and take off width of jamb opening at top and bottom. Mark the widths on the door, apply the straight edge and joint the door, beveling the edges slightly toward the face side. The door head may be squared and dressed off in the same manner. The door can now be tried in place and scribed for the threshold or saddle and allow for the clearance at top and bottom.

In marking the edges of the door for the butts, I use a rod with marking needle-points, at the top of the rod I screw on the end a thin piece of steel say $^1/_{16}$ of an inch or less, letting it project over the edge, as shown in Fig. 74; this serves as a fence or guide to top of door while mark-

ing for butts. Then apply the rod to the jamb of the frame pushing the steel plate against the head which will indicate the thickness of clearance between the door and frame.

Where neat and well fitting work is required, the door jambs should be beveled off slightly with the fore plane to relieve them of uneven places on the surfaces.

DOOR HOLDERS

In the above article by Mr. Browne, he describes one form of a door holder; there are quite a number of other forms in use by various carpenters, and it will no doubt be of considerable interest to present a few.

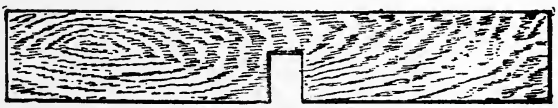


FIG. 75

One of the simplest is shown in Fig. 75: it is simply any piece of waste wood, cut so that it will fit tightly between the jambs, with a notch large enough for the door to fit in.

This door holder is easily put up in any doorway of the same size, and is simpler than Fig. 76, which can also be made very easily from some waste pieces of studding.

Fig. 77 shows another simple design which will hold the door firmly in place while being worked, and has the additional advantage of being very quickly and cheaply

made, as all the material can usually be obtained from waste pieces on the job.

The piece *A* is $\frac{7}{8} \times 10 \times 20$ or 24 inches. *B* and *C* are $\frac{7}{8}$ inch thick, 10 inches long and 8 or 10 inches high. *D* is a piece 2×2 inches, fastened on the back side of *A*, to take the end thrust of door while being dressed.

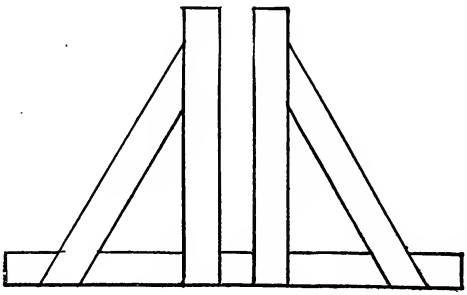


FIG. 76

B and *C* are fastened to *A* by nailing through *A* from the under side. The distance between *B* and *C* should be same as thickness of door you are working. Drive

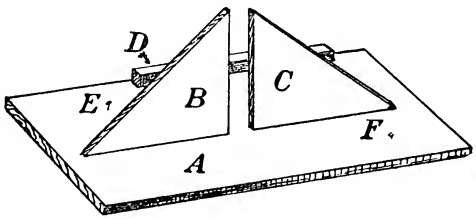


FIG. 77

nails at *E* and *F*, which will secure holder while in use and are easily removed, allowing holder to be removed from room to room.

Mr. E. E. Bragg says that the previously described door holders are well enough as he has used them, but

that the kind shown in Fig. 78 is the best. In his work he is called on to plane quite a number of doors and found that this one holds the door more firmly. To construct this, take, for *A*, a 1×4, 30 inches long; *C*, a 1×4,

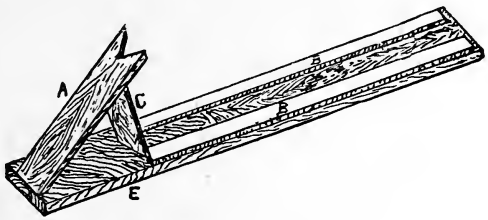


FIG. 78

16 inches long; *E*, a 2×6, 7 feet long; and *B*, just a plastering lath or a 1×2 nailed on either side to hold the door; nail them $1\frac{1}{2}$ inch apart, or whatever the thickness of the door may be.

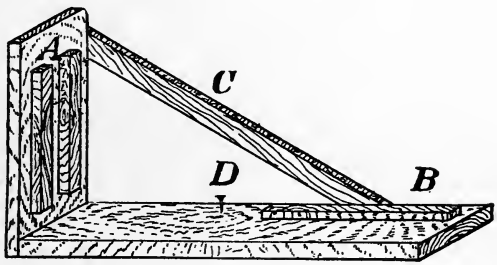


FIG. 79

A very interesting communication was received from Mr. F. C. Bell, in which he says his design, Fig. 79, is superior to other door holders.

The one you first described is not a good one to stand the end thrust which the door receives when being dressed.

The second one, which I used myself until I discovered a better way some years ago, has the great disadvantage that you cannot drive it tight enough between the door jambs without driving them apart, and a door fitted when the holder is in place is apt to bind when it is removed.

Fig. 79 is a sketch of one which I have found to be satisfactory in both these respects, and it also has the advantage of preserving the lower edge of the door while the other is being dressed.

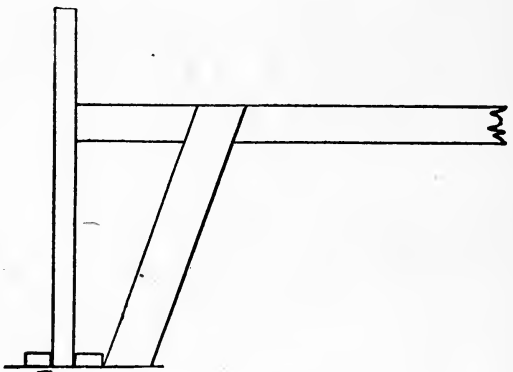


FIG. 80

It consists of two pieces of 2 × 6-inch or even 1-inch stuff, nailed together at right angles, the bottom one about 5 feet long, and the other must be cut off so it will not come above the door. A brace is fastened on one side at *C*. Two cleats are also nailed on at *A* to suit the thickness of the door, and another one at *B* will keep the door firm, while a nail driven through at *D* will keep the holder firm, and is easily removed, allowing it to be taken from room to room.

Our old friend the trestle can be used as a door holder if the saw horse is made like Fig. 80. This is the suggestion of Mr. J. M. Karrash.

Use two trestles, place them in position, so that the door will rest as shown; then nail the blocks on the floor to hold the door from slipping.

DOOR AND SASH HOLDER

For shop use a useful hint is made by Mr. E. S. Frye and shown in Figs. 81, 82 and 83. This little tool can

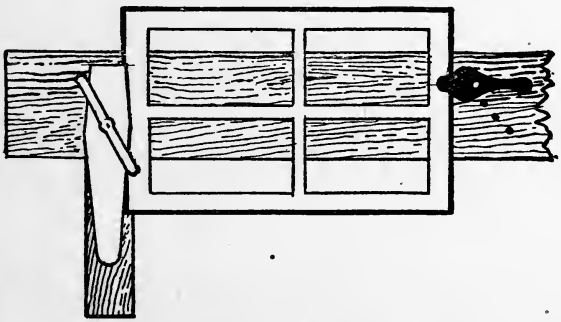


FIG. 81—HOLDER CLOSED

be carried in the drawer of your bench, and as it is only 10 inches long it will not take up much room. The handle can be made of hard, tough wood, also the eccentric, which must be as thick as the sash or door to be dressed. Holes can be bored in the side of bench to admit different lengths of sashes and doors, and it takes only a few minutes to adjust it. The illustrations explain the method and manner of construction.

TO MAKE BADLY FITTING BLINDS AND DOORS SHUT TIGHTLY

When blinds and doors do not close snugly, but leave cracks through which drafts enter, the simplest remedy, recommended by Mr. Schuetse, building commissioner in Dresden, Germany, is this: Place a strip of putty all along the jambs, cover the edge of the blind or door with chalk, and shut it. The putty will then fill all spaces which would remain open and be pressed out where it is not needed, when the excess is removed with a knife. The chalk rubbed

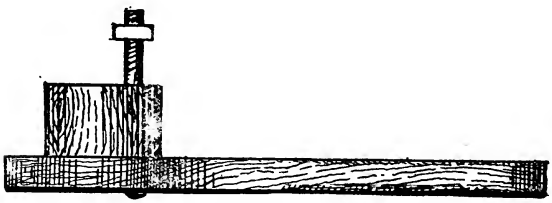


FIG. 82—THE ECCENTRIC

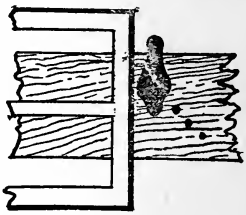


FIG. 83—HOLDER OPEN

on the edges prevents the adhesion of the putty to the blind or door, which can then be opened without adhesion, and the putty is left in place, where it soon dies and leaves a perfectly fitting jamb. Any smart boy can do this.

HINTS ON FITTING SASH

Mr. Harry H. Rotherwel sends in a sketch of a "sash holder" that will be found to pay for itself in the saving it will do in preserving the edge of your plane irons and the face of your plane. I myself found it troublesome

before I used this plan, as whenever a new building is supplied with a floor, a troop of spectators will always walk up to the windows and look at the surrounding neighborhood. They carry more or less sand or dirt where they walk or step. Often, also, the plastering is done before the sash is fitted because the planing mill man is behind in deliveries.

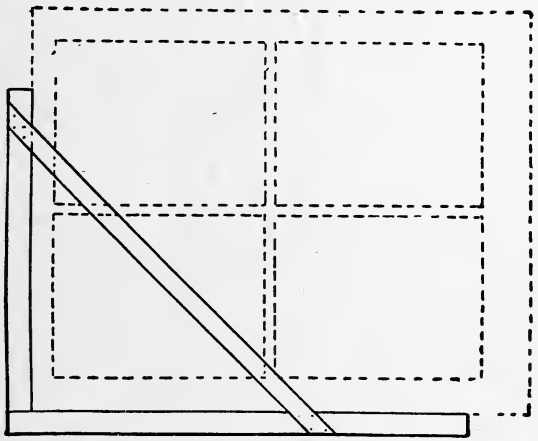


FIG. 84

From these causes you can well imagine that it is impossible to get a clean floor, so when fitting sash they should not be placed on the floor, but a holder should be used—it will save your planes.

The holder is shown in the figure and is made of $\frac{7}{8} \times 4$-inch stuff for floor and upright piece; for the brace almost anything will do.

Nail it together and brace it to the angle of your steel square. Fasten a block $\frac{7}{8} \times 2$ inches and 4 inches long

opposite your brace, and it will hold your sash very firmly.

In use the sash holder is nailed to the window sill and then you are ready to begin. The upright piece of the holder may be 26, 28 inches, etc., according to the height of the window sill.

DOOR CHECK

Mr. Francis L. Bain submits a design of a door check, Fig. 85, which has proved to be exceedingly useful when it was desired to hold open any door which was fitted with a spring, or a door which was inclined to "slam to" on a windy day.

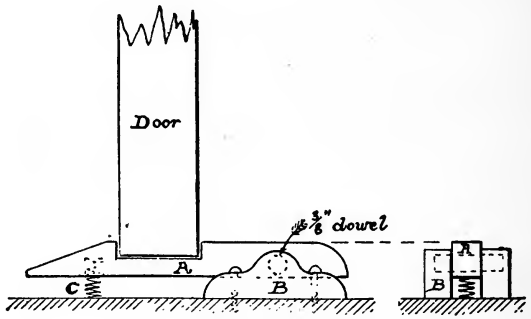


FIG. 85

The check, *A* (about $7 \times \frac{3}{4} \times \frac{5}{8}$ inches), is hinged on a $\frac{3}{8}$-inch dowel, which extends about half-way into each of the two supports, B, which are about $3 \times \frac{1}{8} \times \frac{5}{8}$ inches, with two round-head screws attaching each support to the floor. A small spring, *C*, of medium tension is let into *A* near the end as shown, so it just touches the floor. *A* is depressed by a light pressure of the foot and

comes back into its original position when pressure is removed. The slot is cut to fit the thickness of the door on which it acts, and if the point of *A* extends about 1¾ or 2 inches beyond the surface of the door, and beveled as shown, the door will easily ride into the slot without any difficulty.

The check is very useful, as a trial will quickly demonstrate.

The height of this check is determined by the thickness of the threshold (which is usually about ⅞ of an inch). If greater or less, the measurements as given can be slightly altered to suit conditions.

A DOOR-KNOB HINT

A scheme devised by Mr. Irving D. Banks is shown in Fig. 86 which will save the stooping or groping to turn the door knob of a door placed at bottom of a dark, steep or winding stairway. It may be of service to others.

It is extremely simple to make, and the cost is practically nothing.

Take a piece of brass about $^1/_{32}$ or $^1/_{16}$ inch thick, ½ inch wide and 3 inches long. Bend it around the shank of knob, leaving one end projecting. The size of this clamp must be slightly less than the size of the shank, so the bolt will draw it tight.

Punch holes through brass where it meets, and also a hole through the long end or ear. Bolt clamp to shank

so ear is horizontal and connect wire from end hole in brass to end hole in a wooden lever, which should be about 6 inches long and screwed to the door, first putting a little block of about ½ inch thickness between lever and door in order to give finger room.

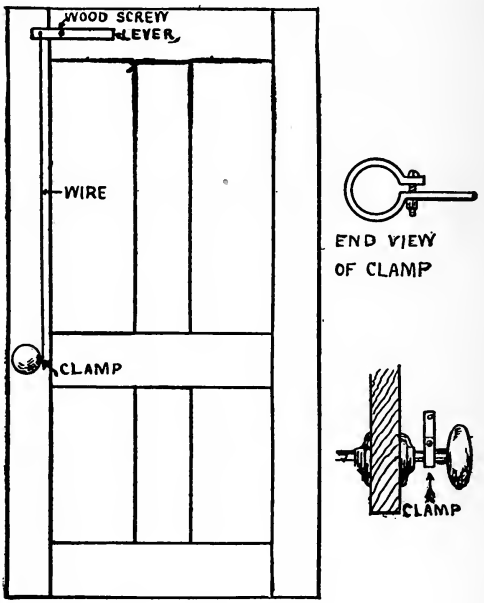


FIG. 86

ABOUT HATCHWAYS

Carpenters are often called upon to fix hatch doors, and the usual practice has been to cut a recess in each door so as to make a hole in the middle, *C* (Fig. 87), for the rope to go through when both doors are closed. The rope, however, does not go down in the middle on account of its moving along the drum as it is being unwound

or lowered; hence it is necessary for any one on a lower floor to go up stairs and put the rope through the hole when it is to be lowered and the hatch doors on the upper floors are closed. This causes a good deal of climbing stairs and also a considerable amount of swearing.

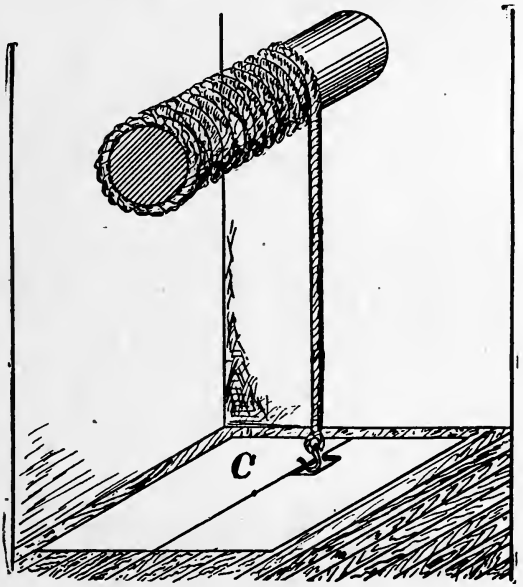


FIG. 87

I have followed the plan of letting the rope come down, and where the hook at the end of the rope touches the door, to cut the hole there. This will be seen by the above sketch. As can be readily seen, the rope can be let down through a number of closed hatch doors without its being caught.

"DEAFENING" FLOORS

From a French journal we gain another suggestion

for a method of "deafening" floors, attributed to General Loyre, who proposes, instead of loading the floors with plaster, to fill in the space between the boarding and the plastering of ceiling with shavings which have been rendered incombustible by dipping them in a tub of thick whitewash. As it is known that soft substances inclosing air spaces form an excellent non-conducting material to sound, it is thought that the shavings so treated will be found of great service, and it is said they are so incombustible as to add considerable to the fire-resisting properties of the building. When it is desired to disinfect the space between the floor and ceiling, the shavings may be saturated with chloride of zinc, or the latter may be added to the lime wash.

SELF-DROPPING BEAMS

In brick houses the beams should be cut at the ends as shown in Fig. 88, so that they will fall out easily without overturning the wall in case of fire in the building. This makes the insurance rate about 1 per cent. less than if the beams were cut so as not to be self-releasing.

FLOOR ON CONCRETE

Fig. 89 shows a method of nailing down a wood floor over a concrete cellar floor.

The flooring is nailed to 3×3-inch sleepers of trapezoidal form, about 12 or 14 inches apart, as shown in

the illustration. These sleepers are embedded in the concrete so that the tops of the sleepers and concrete are even. When the sleepers are made in this form, they are not likely to work loose; as an extra precaution they should be nailed at the ends and every 6 feet of span.

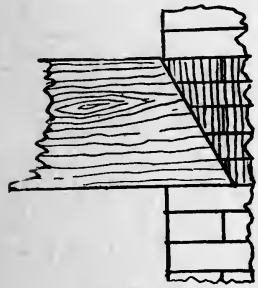


FIG. 88

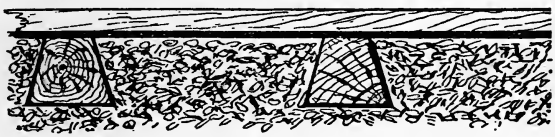


FIG. 89

A good plan is to cover the top of the concrete with one or two thicknesses of tar or sheathing paper and lay the floor over this in the regular way. The flooring should not be laid until the concrete is thoroughly dry, or else the floor is liable to warp owing to the dampness.

CRACKS UNDER BASE-BOARDS

When a house settles, it frequently leaves a space between the base-board and floor which does not look nice, to say the least. To repair this I always nail a strip of quarter-round to the floor, hence if any further slight settlement takes place no opening will show.

It would be a good plan if this is done in new houses of low cost.

FILLING FOR CRACKS IN FLOORS

For filling cracks in floors, boil paper pulp and fine sawdust together for several hours and mix with glue dissolved in linseed oil. Put on the filling and leave till partly dry; then cover with paraffin and smoothen with a hot-iron.

HOW TO PUTTY CRACKS IN FLOORS

A writer in *Popular Mechanics* says that many mechanics may have had trouble in filling cracks in floors, previous to painting. It seems that no matter how tightly the putty is pressed in with the putty-knife, it will rise

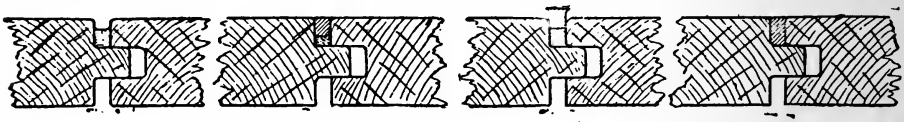


FIG. 90 FIG. 91 FIG. 92 FIG. 93

out of the cracks and project above the surface of the floor a few days after the paint has been applied, thus producing a very undesirable appearance.

This is usually caused by the presence of dust in the cracks and by applying too much pressure to the putty. As it is almost impossible to fill the cracks without applying considerable pressure to the putty, it becomes necessary to remove the dust or dirt. The necessity of this operation is illustrated in the accompanying sketch. Fig. 90 shows a crack in the floor with a quantity of dust at the bottom. This dust is compressed by the application of the

putty, as shown in Fig. 91, and as the compressed dust is somewhat elastic, it tends to expand to its original volume. This results in raising the putty from the cracks as shown in Fig. 92.

In order to prevent this defect, run the pointed end of a file or other pointed object through all the cracks, thus removing all the dust. Then apply turpentine to the cracks by means of an oil can. This soaks into the wood and causes the putty to stick better, at the same time softening the putty and allowing it to fill all parts of the cracks as shown in Fig. 93. Cracks puttied in this way will remain filled for years and be practically invisible.

ORNAMENTING WOOD

Wood can be ornamented by punching down carefully in patterns, planing off a little, and then wetting; the parts punched down show in relief against the planed surface and make quite a puzzle. The edges of the punches should not be too sharp.

TO MAKE A WATER-TIGHT TROUGH

Joint up the plank and then, with a wide punch, set down a groove about $^1/_{16}$ inch deep along the center and extending the whole length of the edge. Then take off two or three shavings more and put the trough together. When the water gets into the trough, the groove swells out again, just the thickness it was at first and, of course,

two or three shavings thicker than the plank, so closes all up tight.

FIREPROOF WOOD

A great deal has been said recently about the fireproofing of wood used in building construction, but we have seen no hint in regard to the fireproofing of that very inflammable material known as excelsior. As our readers all know, it is a favorite material for the stuffing of the cheap kinds of furniture; it therefore finds its way into situations where exposure to fire-breeding accidents are common, and as a result we have recently had several small fires caused by the ignition of the excelsior used under such conditions. It would, however, be very easy to render all excelsior used for such purposes fireproof by any one of several well-known solutions — common alum amongst others. The expense would be trifling, and the increase in safety would be very great.

Wood such as shingles may be rendered comparatively fireproof by being first soaked in a solution of alum and then whitewashed with lime. The same preparation may be applied to thatch, etc. Water containing alum and sulphate of ammonia in solution is very efficient in putting out fires. A quart of such water doing as good service as a gallon pure water. Hence it is a good plan to dissolve some of these salts in any water that may be kept standing in vessels for the purpose of extinguishing fires. Another

advantage secured by the use of these salts is the fact that such water does not corrupt and become offensive.

FILLING NAIL HOLES

The reason that nail holes, after being filled up with putty, become unsightly by the putty lifting up, is because the grains of the wood are crushed down, and when the wood becomes damp the grains swell up and lift the putty.

To prevent this, wet the wood around the nail head after it has been punched in, which will make the broken fibres of wood to expand. When dry, sandpaper smooth, when the putty may be placed in the hole. To make the putty hold, the broken fibres should be painted first.

DENTS IN WOODWORK

Mr. Jacob C. Miller gives the following hints on how to take out or raise hammer marks or dents on wood:

To raise hammer marks in soft woods—such as pine—all you have to do is to soak a little sawdust in water and apply to the dent and let it stand over night; but if you are in a hurry and cannot wait that length of time, just fill the dent with wood alcohol, let it stand for a minute to soak and then light a match and apply it to the alcohol. Watch very carefully so that the wood does not burn. In case it does, blow out the flame, and wait a minute or so,

then fill the dent again with alcohol and repeat the process as at first until the dent is raised to the surface of the wood. This plan will do the same work on oak.

I have another little scheme which I think good; that is to use beeswax instead of putty in nail holes in yellow pine. It matches the color and you cannot tell where the nail hole is without a very careful examination.

CEMENT FOR STOPPING FLAWS IN WOOD

Put any quantity of fine sawdust of the same wood your work is made with into an earthen pan, and pour boiling water on it, stir it well, and let it remain for a week or ten days, occasionally stirring it; then boil it for some time, and it will be of the consistence of pulp or paste; put it into a coarse cloth, and squeeze all the moisture from it. Keep for use, and, when wanted, mix a sufficient quantity of thin glue to make it into a paste; rub it well into the cracks, or fill up the holes in your work with it. When quite hard and dry, clean your work off, and if carefully done, you will scarcely discern the imperfection.

A VENEERING HINT

A writer in *The Woodworker* says that in veneering onto solid wood, in making mantels, etc., it is possible to have the lumber too dry, so that when it absorbs moisture it will swell some and the veneer face will crack. Some-

times people, in their anxiety to have the lumber dry, make the mistake of overdoing it. Old veneer men say that lumber, after having been dried, should be allowed to temper in the open atmosphere for a week at least, before being used as a body for veneer.

ANTIQUE OAK

To render new oak wainscoting and oak furniture dark and give it an antique appearance, we have it from good authority that ammonia is the cleanest, best and cheapest material that can be used. The liquid stains commonly used are apt to raise the grain of the wood, make it rough, and it is with difficulty to tell whether the wood is really new or old. A correspondent in the *English Mechanic* gives the following process of treatment, which he considers the best, after trying the various other processes used by builders and cabinetmakers to darken woods:

"Oak is fumigated by liquid ammonia, strength 880 degrees, which may be bought at any wholesale chemist's, at five cents a gallon. The wood should be placed in a dark and air-tight room (in a big packing case, if you like) and half a pint or so of ammonia poured into a soup plate, and placed upon the ground in the centre of the compartment. This done, shut the entrance and secure the cracks, if any, by pasted slips of paper. Remember that the ammonia does not touch the oak, but the gas that comes from it acts in a wondrous manner upon the tannic

acid in that wood, and browns it so deeply that a shaving or two may actually be taken off without removing the color. The depth of shade will entirely depend upon the quantity of ammonia used and the time the wood is exposed. Try an odd bit first experimentally, and then use your own judgment."

A simpler method, but not so good, is by sponging with a strong hot solution of common soda in water. This will raise the grain which must be cut down with sandpaper.

CEMENT FOR WOODWORK

The following cement will be very hard when dry, and will adhere firmly to wood: Melt one ounce of resin and one ounce of pure yellow wax in an iron pan, and thoroughly stir in one ounce of Venetian red until a perfect mixture is formed. Use while hot.

CLEANING WOODEN FLOORS

The dirtiest of floors may be rendered beautifully clean by the following process: First scrub with sand, then rub with a lye of caustic soda using a stiff brush, and rinse off with warm water. Just before the floor is dry, moisten with dilute solution of hydrochloric acid, and then with a thin paste of bleaching powder (hypochlorite of lime). Let this remain on the floor over night, and wash in the morning.

A GOOD WOOD FINISH

Mix equal parts of good liquid shellac and boiled linseed oil, and apply it with a piece of cheese cloth. Keep applying and rubbing vigorously until the grain is filled, then polish off with a dry rag. The result is the same as varnish, well rubbed.

A particularly fine finish can be given in this way to a piece of turned wood while it is still revolving in the lathe. If necessary, the wood may be first stained to any desired color.

TO POLISH FLOORS

Put some spermaceti into a saucepan on the fire, and mix it with enough turpentine to make it quite fluid; then with a piece of flannel put it very thinly on the floor. It must then be rubbed with a dry flannel and brushed in the same way that oak stairs are polished. This part of the process, rubbing and brushing, takes a long time to do thoroughly.

Another: Dissolve half a pound of potash in three pints of water, in a saucepan on the fire; when the water boils, throw in one pound of beeswax cut up in small pieces; stir it well until the wax is quite melted. When the polish is cold, if it be too thick, add more water.

To apply this polish, use a brush and paint the boards evenly with it; and when it has dried, rub them with a flannel tied at the end of a broom.

WAX POLISH FOR WOOD

An excellent wax polish for wood is made by boiling a quarter of a pound of white wax with one ounce of pearl ash in a quart of water. It should be continually stirred while boiling until thoroughly cool. It is applied to the surface of the wood with an ordinary paint brush, and rubbed briskly until dry with a velvet or plush rubber. A very high polish is the result.

VARNISHING

When varnishing fretwork use white hard spirit varnish; it requires no size; the application is to be made in a warm room; or fill in the grain of the wood with glue size and varnish with brown, hard varnish.

VARNISH REMOVER

A strong application of ordinary spirits of camphor will remove almost any kind of polish or varnish. Give the spirit time to evaporate before repolishing, or it will injure the new polish.

TO REMOVE STAINS FROM WOOD

To half a pint of soft water put an ounce of oxalic acid and half an ounce of chloride of antimony; shake well, and when dissolved it will be very useful in extracting stains, as well as ink from wood, if not of too long standing.

PUTTING UP SHELVES

The putting up of a shelf is, it would seem, too simple a subject for any one to bring out anything new, but the following hints by Mr. Emery H. Chase will be found of interest to every carpenter:

How many of the carpenters have been called upon to put up shelves in lath-and-plastered houses, where there

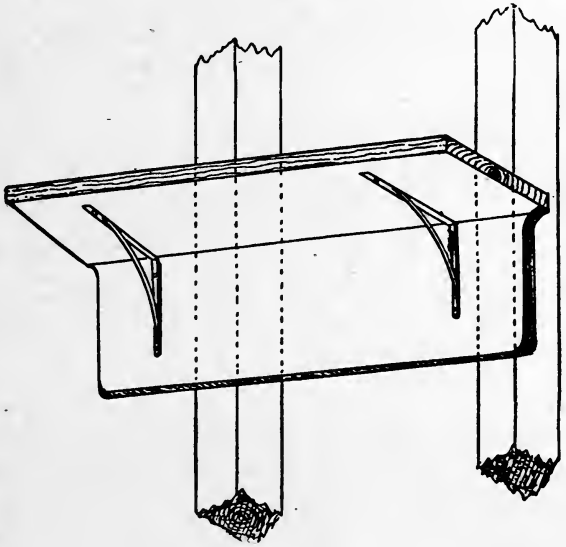


FIG. 94

is no sheathing behind the lath and where the lath are nailed against the studding?

Well, you all know, very likely, that the studs seldom come in the right place in which to fasten the shelf brackets, so the brackets will be spaced rightly from the ends of the shelf. Here is a way out:

Make the shelf like Fig. 94 with a piece behind it, as

shown. By this method it will not matter whether the studdings come squarely behind the shelf or nearer one end. The back piece can be nailed to the studding wherever they happen to come; and the brackets can be spaced rightly with the shelf and placed against the back piece. The illustration shows two studs "out of center," as they usually happen to be.

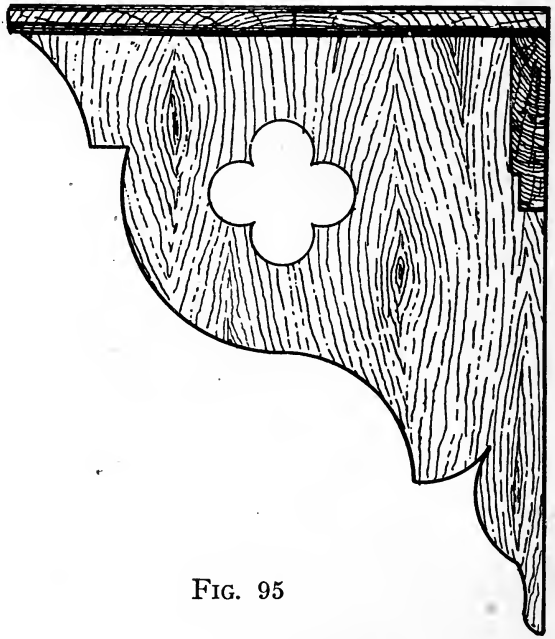


FIG. 95

Wherever it might be considered that the back piece would not look well, a very narrow one could be used close up under the shelf (Fig. 95). A wooden bracket would probably be necessary, however, as the backpiece would hold the iron bracket too far from the wall and the wooden one could be cut to fit the backpiece.

FLOUR BOX

In finishing a house a carpenter is often called upon to make a flour box, hence the design in Fig. 96, by Mr. C. B. La Croix, will be a good hint.

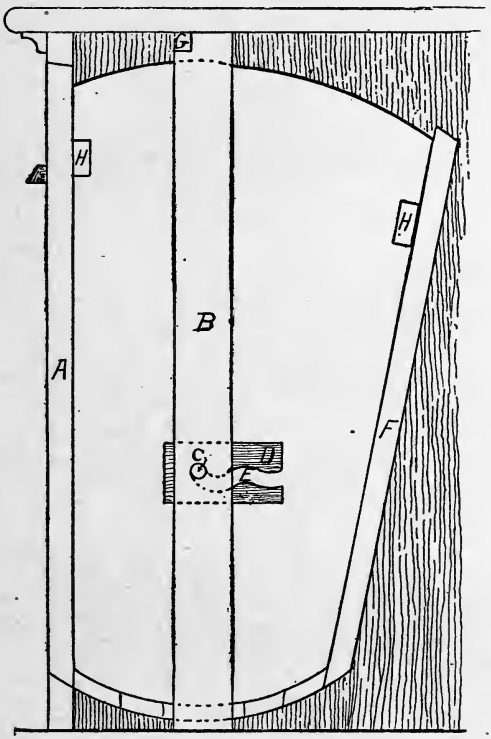


FIG. 96

The ilustration shows a suitable flour box for a pantry or other similar place which may be easily made by any carpenter.

A shows the front; this is made the same as the other parts of the pantry. *B* is a 2 × 3-inch piece into which the shaft, *C*, is fitted. The square, *D*, is a ⅞-inch board

fastened to the box, which is cut out as shown, as this curved cut makes it more convenient to take the box out or placing it in. *F* is the back part. *G* is the stop fastened

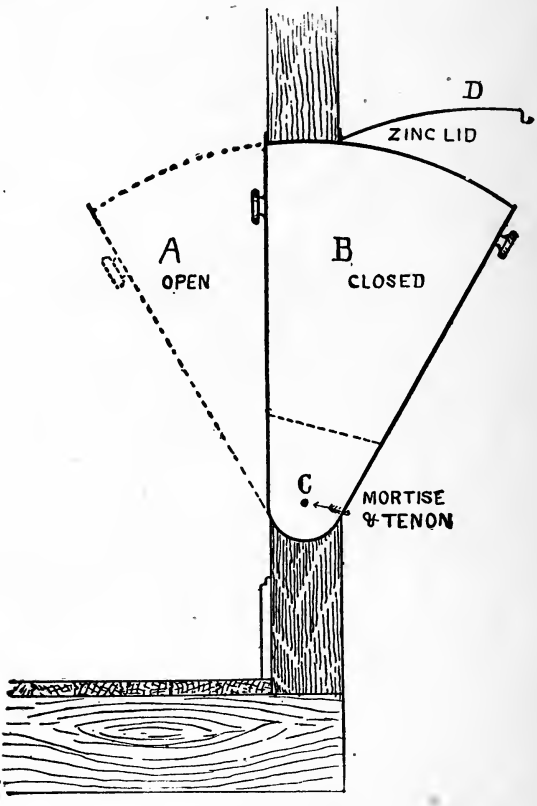


FIG. 97

to *B*. *H H* are strips to which the back and front is fastened. The shaft, *C*, must be set accordingly, so that the box remains in or out, as desired.

COAL OR WOOD BOX

Mr. C. S. Frye submits a plan, in Fig. 97, of a box

that will answer equally for wood or coal. This box can be swung between two studs which have been bored through at *C* with an inch bit and about 10 inches from the floor; this is to admit a rod which runs through both ends of the box and the studding on each side permitting it to swing in or out. The wood can be put in from the outside by lifting up the zinc lid, *D*. When not in use, it can be pushed outside and out of the way.

A HANDY TRUCK

Here is a very handy truck for various uses: A carpenter can put his tool chest on it and take it anywhere on a comparatively smooth surface.

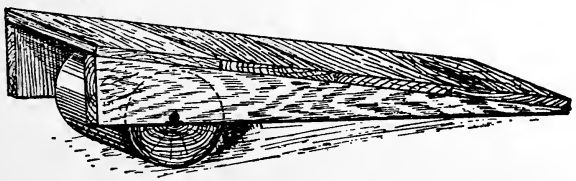


FIG. 98

The roller is 4 inches in diameter and 12 inches long. The top is 16 inches wide and 18 inches long—some might prefer it longer.

The side pieces are cut from a single 2 × 4-inch plank; cut at the proper angle, as shown. For the top any inch pieces will do.

The axle in the roller should be ¾-inch round iron or steel. It is shown complete in Fig. 98.

This truck will transport heavy timber, boxes, and is very handy to move stoves, trunks, etc., says Mr. D. J. Dodrill.

GAUGING SIDING

Mr. Fred Black says that he has seen many carpenters who will go to work and gauge the siding with a scratch gauge and think they are doing a good job, but they are simply doing a bad thing. It is all right to gauge the siding, but never use a scratch gauge, as in a short time you will find that the siding has cracked where the scratch was made. Use a pencil to mark with and do a first-class job.

SIDING GAUGE

Thinking that a few hints on beveled siding would be of interest, Mr. William Sinnigen contributes the following:

I have been in some of the Western States, but have never seen any way to beat our method of doing it here, either for speed or for making a good job.

The tools needed are a good, sharp pony saw—No. 10 will do—a small try square, block plane, pair of compasses, and a hammer. The first thing we do is to get a pair of saw horses and put a plank about 16 feet long on them; this is to lay the bundles of siding on while gauging them. Then we put some bundles of siding on the horses, picking

the lengths that will cut to the best advantage, and laying them so it will not be necessary to turn them when we are ready to gauge them. Then, after finding the distance between water-table and the under side of window sills, and then from under side of window sills to top of drip cap or molded cap, as the case may be, we gauge enough siding to about cover the spaces and then cut one end square slightly under toward back of boards, so the face will fit snugly against corner boards, window casings and door casings, which should be planed slightly standing to make a good, tight job. When working on small stretches

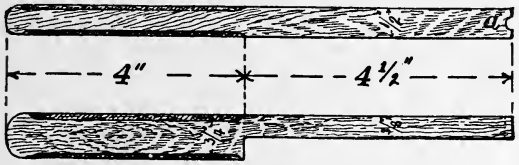


FIG. 99

between windows I always cut enough boards to fill the space square on one end and half an inch longer than the distance between casings. By doing this cutting or gauging on the ground or floor of building, the balance of work on scaffold can be done much more rapidly, and the boards can be handled easier when putting on the siding. After the first board is on, we tack a few six-penny finishing nails on the gauge line to rest the next board on, and so on to the finish. It is customary in this section to have the siding lap as near to one inch as possible to make a good job, also to use a good brand of building paper under

the siding, and the better class of houses are sheathed with matched or shiplap hemlock or common pine, surfaced one side. Six-penny nails are used to fasten the siding with, and I have found that by driving the nail at a slight angle they hold better than when driven straight, and they will set in so that they can be puttied by the painter. Fig. 99 shows a sketch of the gauge, as we use it, *a* is a recess to hold a pencil.

TEMPLATE FOR RAFTER CUTS

As hip roofing seems to be the order of the day, Mr. W. F. Petch sends in the following hint:

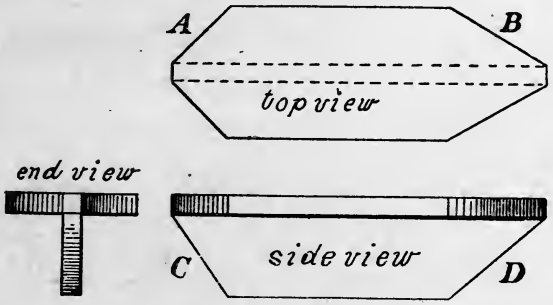
Fig. 100 is a design for a template for laying out jack rafters which I consider quite a time-saver. It may be old to some, but is nevertheless good. Take two pieces of board and nail them together at right angles as per sketch, making top board at least twice the thickness of jack rafter plus thickness of board in center, and the center board as wide or a little wider than rafter; cut bevel for edge of jacks on top board right and left, and down cut on center. The opposite end might have cuts for hip and valley in same manner.

A ROOF-FRAMING HINT

No doubt many readers are young carpenters who are studying the various articles and books giving instruction of how to get the various cuts for the different rafters

used in roofs, etc. But it is not every young man who has the good fortune of being able to apply this to actual work soon after learning about the new method.

The writer has been in this position, but has overcome this deficiency by working out the problems on a small scale—that is, I use small strips of pine ($\frac{1}{2} \times \frac{1}{2}$ inch) for the rafters. These strips are very cheap, and every young carpenter can certainly afford to work out prob-



A = cuts for edge hip or valley.
B = cuts for edge of jacks.
C = down cut for hip or valley.
D = plumb cut.

FIG. 100

lems in this way. He will learn how to frame roofs, etc., much better than by reading alone. For shingles I used small pieces of cardboard.

RAFTER GAUGE

When laying out rafters, I find it a handy thing to have a smooth board on which are marked the bevels for the various cuts to be used. All that is necessary is to set the bevel as shown in Fig. 101. It is a time-saver.

SHINGLES

A prominent shingle manufacturing concern sends out a circular of instruction to carpenters, as follows: "A shingle, like a board, will split or check more easily in the centre than elsewhere, and therefore the centres of one tier of shingles should not cover joints of the tier below. To avoid this, break joints one-third the distance from the edge, and thus make a roof that will not leak. Always nail on the same edge, so that when the shingle seasons, it will not crack or check. Do not nail

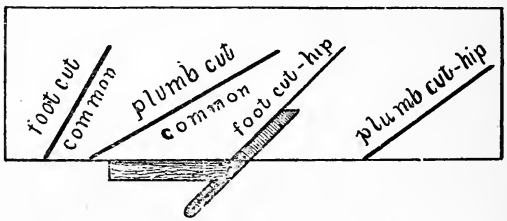


FIG. 101

cypress shingles on both edges. If shingles are five inches wide, one nail is sufficient; if six inches wide, use two nails, but on the same edge, and about one inch from the edge." The circular claims that cypress shingles do not rust nails, and that, if they are laid according to the foregoing instructions, the roof will remain perfect. Dealers in cypress shingles would do well to note down these directions and chisel them into the minds of green or careless carpenters. Without doubt, in case they are followed, there will be no complaints about cypress shingles splitting.

LOOKING INTO DARK PLACES

It is often necessary to examine the bottom of a tube or hole. Wells and gun-barrels afford familiar examples. Nothing is easier, provided we illuminate the cavity by means of a good light thrown down by a mirror. For wells, cisterns and ponds a good common hand-mirror will answer, but for narrow tubes, like gun-barrels, a little management is required. The mirror must be held so as to reflect a strong light (sunlight is best, but any good lamp will do) down the barrel, and at the same time it must be so placed that the eye can see past its edge and look down the tube. This can be done, but a great improvement is to scratch a small oval hole in the silvering, so as to leave the mirror transparent at this point. It then becomes easy to look down the barrel through this hole, while the silvered part of the mirror covers the whole of the tube and throws a flood of light down it. In this way rust spots and imperfections can be detected at the bottom of the smallest bores.

For wells and ponds no such refinement is necessary. When the sun is shining brightly, hold a mirror so that the reflected rays of light will fall into the water. A bright spot will be seen at the bottom, so light as to show the smallest object plainly. By this means we have examined the bottoms of wells fifty feet deep, when half full or more of water. The smallest straw or other object

can be perfectly seen from the surface. In the same way one can examine the bottom of the ponds and rivers, if the waters be somewhat clear and not agitated by winds or rapid motion. If a well or cistern be under cover, or shaded by a building so that the sunlight will not fall near the opening, it is only necessary to employ two mirrors, using one to reflect the light to the opening, and another to reflect it down into the water. Bright sunlight may be thrown fifty or a hundred yards to the precise spot desired and then downward.

We have used the mirror with success to reflect light around the house to a shaded well, and also to carry it from a south window through two rooms and then into a cistern under the north side of the house. Half a dozen reflections of light may be made, though each mirror diminishes the brilliancy of the light. Let any one not familiar with the method try it, and he will not only find it useful, but a very pleasant experiment. It will, perhaps, reveal a mass of sediment at the bottom of a well that has been little thought of, but which may have been a frightful source of disease by its decay in the water.

TO SPACE BALUSTERS EVENLY

Lay the balusters together and measure across them; subtract this amount from the distance or space to be enclosed, then divide by the number of balusters plus one.

If a piazza opening 11 feet 6 inches long is to have a railing made up of 30 balusters 1½ inches wide, we first multiply $1\frac{1}{2} \times 30 = 45$ inches for the total width of the balusters; subtracting this from the 11 feet 6 inches (or 138 inches), we have $138 - 45 = 93$, which we divide by the number of balusters plus one: $93 \div 31 = 3$ inches for the distance between balusters.

HANGING TRANSOMS

Whenever possible, hang transoms so that when they are open the glass will rest on the wood and not on the putty and tins.

RIGHT AND LEFT-HAND LOCKS

A lock which, when the bevel of the spring-catch is in front of the observer, shoots toward the right, is a right-hand lock; if it shoots toward the left, a left-hand lock.

DOORS ON PUBLIC BUILDINGS

Country builders are continually ignoring the law and common-sense by hanging the outer doors of churches and halls of amusement to open inwardly. This is legally and morally assuming an unnecessary risk. All builders should know that a law exists throughout the United States to compel builders, architects, or trustees to hang doors on all churches or public halls so as to swing outwardly. To do so might prevent a catastrophe.

REMOVING PUTTY FROM GLASS

Dip a small brush in nitric or muriatic acid, and with it paint over the dry putty that adheres to the broken glasses and frames of the windows. After an hour's interval the putty will have become so soft as to be easily removed.

SAVING WINDOWS

Sash frames, with sash weights, locks and trim complete, may be taken out of old buildings that are being taken down, and preserved just as good as new by screwing slats and braces on them, which not only keeps the frames square, but prevents the glass from being broken. Doors, frames and trim may also be treated in like manner.

TO REMOVE SPLINTERS

When a splinter of wood gets lodged beneath the nail and it would be torture to dig it out, try putting on a poultice of common yellow soap and sugar mixed into a soft paste with a silver spoon and put on a soft, clean rag. Tie it around the nail where the splinter is lodged and in the morning the bit of wood will be seen nearer the top of the nail, often sticking right out so that a slight pull is all that is necessary to remove it.

A writer in *The Woodworker* says that a man who

has worked wood for a great while is apt to be skilled in the extraction of splinters with a jackknife, but a pair of good tweezers is a mighty soothing tool to have at hand now and then.

TO STOP MOUSE HOLES

Plug up the hole with common soap, as rats, mice, roaches and ants will not attempt to go through it, not liking the taste.

A HINT ABOUT ROPES

The fact that a rope will shrink if it is moistened has been frequently put to practical use when the tackle for raising a heavy weight has been just a little too low and it was impossible to get the load any higher. Wetting the ropes makes them shrink, thereby raising the load.

FUN WITH THE CARPENTER

The carpenter has many tools. You may augur from this that he has to brace up a bit to keep them awl sharp. This adze to his labor, which should be borne in mind by those who would chisel him out of his earnings.

THE CARPENTER—A MIGHTY MAN IS HE

The carpenter is a pillar of society, and though coping with all sorts of difficulties, is seldom floored. He writes

no political articles for the columns of the press, excepting now and then something relating to "cabinet work."

A writer in *The Woodworker* says that one can tell by seeing a new man handle a hammer whether or not he has had much experience in handling the tool. If not, he will catch the handle close to the hammer, peck away at the speed of a trip hammer and hardly move the nail at all unless it is to bend it. But if he "knows how" he will catch hold at the end of the handle make long, even strokes, thus bringing into play the added leverage of the handle and muscle combined, and the nail can be seen to sink perceptibly at every stroke.

INDEX

A

B

C

D

F

G

H

O

P

R

S

T

V

W